AUTOMOTIVE INDUSTRIES

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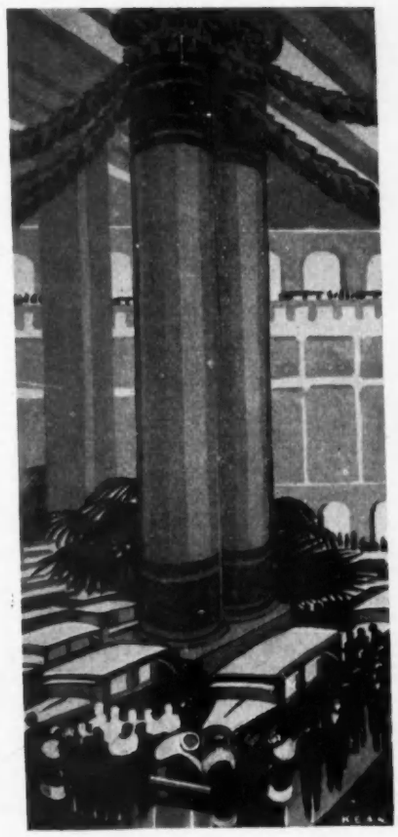
New York Show Opens Sales *Season To-Day*



Cadillac V-16 and several new eights expected to be centers of attention. Calendar for the week is crowded with automotive meetings.

By EARL O. EWAN

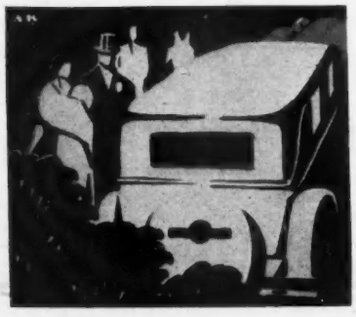
BEARISH forces which have assailed business and industry in the United States within the last two months will be the object of a major offensive throughout 1930 by the automobile industry beginning today with the opening of the New York Automobile Show in the Grand Central Palace, New York City. This event will mark the inauguration of the thirtieth year of the National Automobile Shows, the first of which is the New York exposition, which will be followed by the Chicago exhibition in the Coliseum of that city from January 25 to February 1. These shows will be followed by local exhibitions in every important center of the country, the last of which will not close until late in the spring.

Backed by the all-time sales and production records of 1929, the industry is entering 1930 confident that the new year will be one of the greatest in its history. It will go over the top this afternoon armed with new weapons with which to fight sales resistance in the way of cars that have been improved mechanically, as well as from the standpoint of design, appearance and workmanship.

Doubtless one of the outstanding cynosures of the show will be the Cadillac V-16, the first sixteen-cylinder stock car to be produced in America. A description of this car is published in this issue. Interest is expected to center also around the newcomers in the eight-cylinder field, including the Hudson Great Eight, the Dodge Eight, the new Pierce-Arrow eights, the DeSoto Eight and the Oakland Eight.

Descriptions of these cars will be found in the following pages as well as the new Gardner front-wheel drive car, the Willys Six, which succeeds the Whippet Six, the new Durant chassis models, and several makes on which changes and improvements have been made. In the last named group are the Cadillac Eight and LaSalle, the Pontiac, the Hupmobile Eight, the Erskine, the Chrysler 66 and 70, the Oldsmobile, the Marmon and the Chevrolet.

The New York Show, which will close next Saturday night, and the Chicago Show, will be held under the anspices of the National Automobile Chamber of Commerce, Inc., with the cooperation of the Motor and Equipment Association. Those shows are under the direction of the N. A. C. C. show committee, consisting of Charles D. Hastings, of the Hupp Motor Car Corporation, chairman; Alfred H. Swayne, of the General Motors Corporation, and S. A. Miles, show manager.



The New York Show week will be crowded with automotive dealer meetings and dinners. Association activities will include a meeting of the National Automobile Dealers' Association and a meeting and convention of the Automotive Electric Association, as well as the annual show dinners of the National Automobile Chamber of Commerce, the Society of Automotive Engineers, the Overseas Automobile Club, and the Motor and Equipment Association.

Price increases announced previously and in this issue indicate that passenger car makers have planned carefully to make the necessary profit this year on a reduced volume of sales and output, which should assure the industry, and particularly its dealer organization, of unquestionable stability.

Cadillac V-16, Developing Between , Has Complete *Fuel System*

The front end of the Cadillac V-16, showing the decorative grill on the radiator, two horns and other refinements

Separate piping, vacuum tank, carburetor valve silencer, eliminating tappet braking system are among the

By ATHEL

UNDOUBTEDLY one of the most interesting cars at the New York show will be the new Cadillac V-16, whose 16-cylinder 3 by 4-in. engine, with 5.5 to 1 compression ratio, is said to develop between 170 and 185 hp. at 3200 r.p.m. The car has an hydraulic take-up for the valve-gear, which does away with tappet noises and adjustments; a vacuum assister is applied to the braking system; crankcase ventilation is thermostatically controlled, and two complete fuel systems (piping, vacuum tank, carburetor and manifold) are provided, one for each cylinder block.

Not only is the line of bodies offered with the chassis said to be very attractive and luxuriously appointed, but the chassis itself is finished to an unusual degree. The running gear is ground and enameled; springs are encased in metal coverings, and all accessories under the hood are concealed or "dressed up."

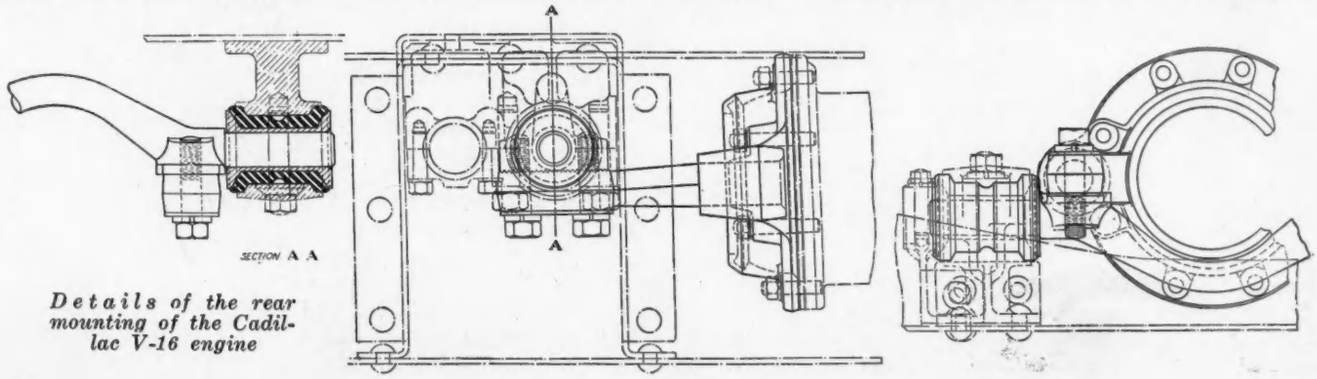
The engine structure is composed of eight castings, of which four are of aluminum alloy and the other four of nickel-iron. The former comprise the crankcase upper and lower sections and the covers for the overhead valves. To improve the oil cooling, the crankcase lower section is provided with longitudinal ribs. The four nickel-iron castings are the two cylinder blocks and the two cylinder heads. Cylinder barrels extend into the crankcase a considerable distance, which in conjunction with the small angle of the V, 45-deg., gives a rather compact engine.

Owing to the short stroke (4 in.), and the large crankshaft (2⅝ in.) and crankpins (2½ in.), the crankshaft is quite rigid, but to make doubly sure of smooth operation it is provided with an harmonic balancer. Connecting rods are located side-by-side on the crankpins, the cylinder blocks being offset longitudinally. Main bearings are of the steel-backed, babbitt-lined type.

Pistons, rings and pins are quite conventional, but the valve gear is a new departure. The single camshaft, for the sake of compactness, is located in the crankcase above the crankshaft, with pushrods operating the rocker arms over the valves, the latter being of the overhead type. To completely silence this mechanism in the engine, an hydraulic automatic valve silencer for valve and pushrod clearance is provided. This mechanism is shown in an accompanying drawing.

It will be noted that each rocker arm is mounted on an eccentric whose lip presses on the top of a plunger in an oil dash pot. The plunger in turn is held against the eccentric by coil springs, while through it are drilled small oil relief holes. In operation this hydraulic valve lash-adjusting mechanism works somewhat as follows:

Let us assume that there is some clearance in the valve mechanism. Owing to the upward pressure on the plunger in the dash pot, the plunger will rise, and rotate the eccentric bushing on the rocker arm shaft until the rocker arm has been lowered, with respect to the shaft center, an amount which will take up the valve clearance. Beyond that point it cannot push the eccentric bushing. Let us assume that it did, and that we had a negative clearance. Under these conditions there would be a constant upward spring pressure on both ends of the rocker arm. These forces, of course, balance themselves with respect to the center of the bushing, but the center of the bushing is to one side of the center of the shaft on which it is mounted. As the forces tend to balance each other about the shaft also, the center of the bushing tends to move toward the cen-



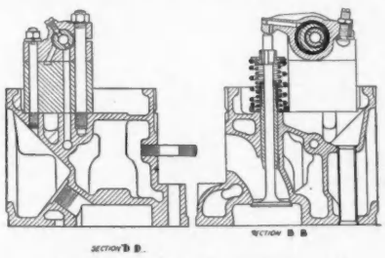
Details of the rear mounting of the Cadillac V-16 engine

170 and 185 Hp. *at 3200 r. p. m. for Each* Cylinder Block

and manifold are provided. An hydraulic noises, and a vacuum assister for the innovations on the new line.

F. DENHAM

ter of the shaft in a direction at right angles to the vertical forces. In other words, the bushing will rotate about the shaft, raising the rocker arm thereby, until a point is reached where the negative clearance has disappeared and there is again zero clearance.



Sectional drawing of the cylinder head

In this explanation of the action of the valve silencer it has been assumed that the rocker arm itself is not in motion, i. e., that the valve is not being opened and closed. As a matter of fact, the lash adjuster is inoperative during opening and closing periods, for the oil holes in the dash-pot piston are so small that the plunger cannot be moved suddenly.

Bushings are kept in place endwise by means of thrust washers and coiled springs between adjacent ones. The entire assembly is rendered accessible by removing the cast aluminum valve covers. An important feature contributing to the effectiveness of this mechanism is that it is always supplied with fresh oil. Engine oil is introduced through the valve covers, and lubrication of the rocker arms and oil supply for the dash pots is obtained directly from the oil filter.

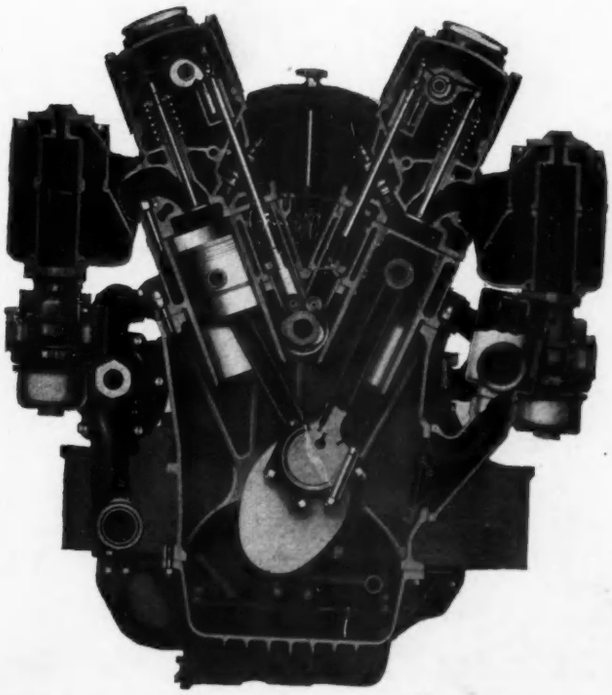
Combustion chambers are oval in shape, and completely machined. The oval shape produces a low clearance space at two sides of the piston, thereby increasing the cooling effect on that portion of the charge which burns last. Combustion chambers are milled out at the top of the sides for valve clearance. Spark plugs are located at the highest point of the chamber, on the side toward the vee of the engine.

Pressure lubrication of the engine extends to the piston pins. The oil pump is located at the rear main bearing and is driven off the rear of the camshaft. There is a full-length oil strainer in the crankcase, the sump below the strainer being provided with transverse baffles to prevent oil surge. The crankcase ventilation system is particularly interesting, in that the inlet air passage is provided with a thermostatic valve inside the crankcase. This valve permits air to enter the crankcase during the warming-up period, when crankcase dilution generally occurs. After the engine is warm, the valve closes to prevent the forcing out of oil mist. A wire mesh air cleaner is provided at the air intake for the ventilating system. The air enters through a funnel which faces forward and thus catches some of the air blast from the fan. There are two outlets for the ventilating system, one at the top of each cylinder head.

A single pump is used to circulate the water. It has two outlets, however, and is of large capacity. One of the outlets leads into the adjacent right-hand block, while the other is connected to a cored passage in the crankcase which carries water over to the left-hand block. There are two outlets to the radiator, of course, one from each block. Thermostatic radiator shutters are furnished. Hose clamps are chrome-plated, and the rubber hose is ribbed longitudinally.

Although a considerable portion of the cylinder barrel projects into the crankcase, the water-jacketed portion of the cylinder extends practically to the top of the piston when the latter is at the bottom of its stroke. The lower portion of the barrel is probably cooled to a considerable extent by oil splashing against it.

The manner of attachment of the cylinder block to the crankcase is worth noting. On the outer sides, blocks are bolted to the crankcase with conventional short studs and nuts. On the vee sides, however, long



Transverse section of the Cadillac V-16 engine

studs are used, passing through holes in the block and extending up through the cylinder head, where the hold-down nuts are applied. Since there is considerable clearance around these long studs in the block, expansion can take place without setting up undue strains. In no case does any stud pull directly on a cylinder bore, so it cannot distort the bore.

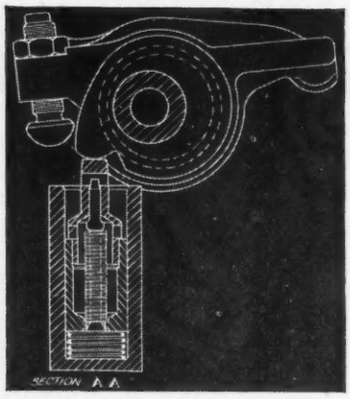
Fans are of the six-bladed type, belt-driven, and mounted in ball bearings that are capable of running 30,000 to 50,000 miles to one greasing.

The two carburetors fitted are quite similar to the standard Cadillac carburetor, except that the automatic throttle is replaced by a weighted air valve at the intake. Suction for the two vacuum tanks is obtained from a vacuum pump driven off the camshaft at the rear. A 25-gal. fuel tank is mounted.

The inlet riser from each carburetor is surrounded by a jacket supplied with exhaust gases from four cylinders of its bank. There are two complete exhaust systems also, and the exhaust manifolds are provided with expansion points.

In the electrical system is found a two-breaker distributor with side outlet for all wires. To make this possible, a ring is placed between the distributor and its cover, half of the wires entering between the ring and distributor, and half between the ring and cover.

Instead of fuses, a vibrator-type of warning signal is provided in the electrical system. To "clean up" the generator, the cutout has been removed to the dash. A polished cover on the dash proper conceals all the usual connections, and "dresses up" the engine compartment. Vacuum tanks are chrome-plated and provided with chrome-plated covers over the piping connections. There is also a chrome-plated cover over the oil filter, which is mounted between the two vacuum tanks on the dash. Radiator brace rods are also chrome-plated, and are grooved in the bottom. In these grooves the wiring for the ignition switch and engine thermometer is carried. Connections between the vacuum tanks and carburetors are of Titeflex metal tubing.



Detail drawing of the Cadillac automatic valve silencer

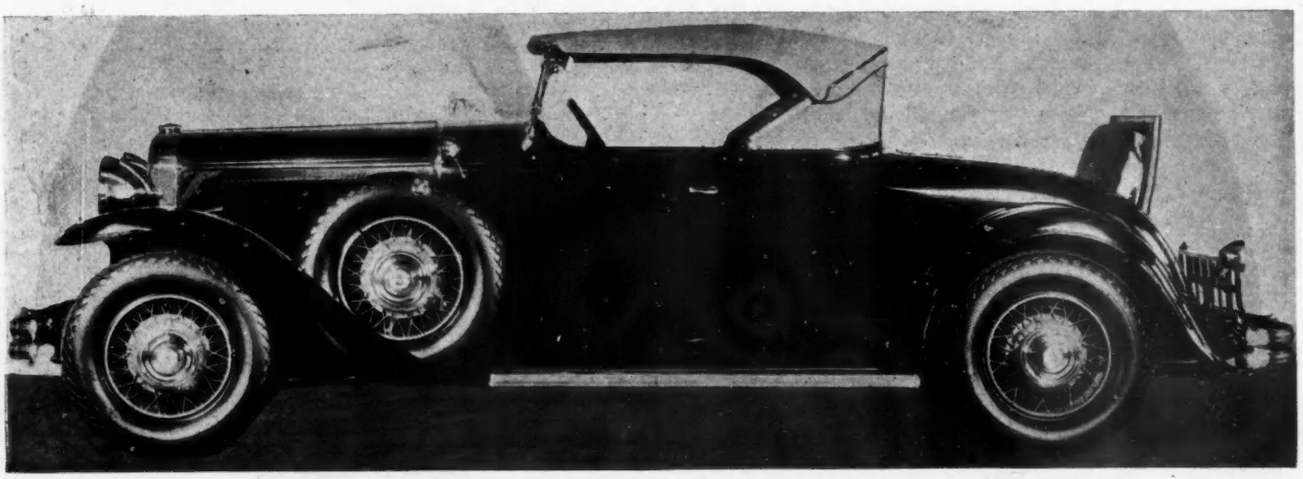
The engine is supported at five points. At the front its legs rest on U-shaped forged diagonal braces between the radiator cross-member and the frame, on rubber washers. Legs on the bell housing are secured directly to brackets riveted to the frame side members and serve mainly to stiffen the frame at this point. The major part of the load at the rear is carried by a trunnion mounting at the rear of the transmission. From a plate bolted to the back of the transmission housing two arms extend backward, and at their ends are bolted to a transverse yoke. The latter is carried in spool-type rubber bushings, carried in brackets attached to a frame cross-member. This mounting also carries the torque tube load.

Although gear ratios and finish differ, transmissions and rear axles appear to follow present Cadillac design closely. Stiffer springs than on the Cadillac are used in the clutch. Steering gears are of the hourglass worm-and-sector type. Brakes are similar to Cadillac design (Huck-type), but include a vacuum booster. This booster is hooked up to the linkage in such a manner that its action is entirely independent of the mechanical operation of the brake. If the booster should be removed, the brake would still function. The booster itself is of the diaphragm type, and is operated from the inlet manifold. Its valve mechanism is so connected to the brake pedal that the suction line is automatically shut off when the diaphragm has reached a position corresponding to the brake pedal position.

A number of minor refinements have been incorporated recently on Cadillac Vee-eight and LaSalle models. These include the adoption of steel-backed main bearings and a change in shoe location in the brakes to give more effective braking.

In addition, ball-and-socket joints are no longer used in the spring suspension, all shackles being of the conventional type. Ignition condensers have been removed from within the distributor and placed on the distributor support.

Buick Introduces Sport Roadster



The Buick long wheelbase sport roadster, with adjustable seat, is priced at $1,585

Prices for Cars and Trucks Drop N. A. C. C. Figures Show

A DROP of 7.3 per cent in the average retail price of passenger cars during 1929, as compared with the average retail prices of 1928, is shown in the preliminary facts and figures compiled by Alfred Reeves, general manager of the National Automobile Chamber of Commerce. The 1928 average retail price of automobiles was $876 per car in 1928 and $812 was the 1929 average retail price. A total of 4,846,000 passenger cars was produced in the United States and Canada during 1929, with a wholesale value of $2,952,900,000. There were 4,024,590 passenger cars manufactured in 1928, with a total wholesale worth of $2,630,0500,000.

Truck prices dropped 8.2 per cent on an average in 1929 as compared with 1928, retailing at an average of $877 per truck last year as against $955 per unit during 1928. Manufacturers produced about 805,000 trucks during 1929 and 576,551 the year before, an increase of more than 28 per cent in production in the United States and Canada. Total production of trucks in 1929 represented a wholesale value of $531,000,000.

Closed car production represented 87 per cent of the total in 1928, 85 per cent of the total for 1928 and 80 per cent of the total during 1927.

Total production of cars and trucks in the United States and Canada reached 5,651,000 in 1929, as against 4,630,000 during 1928, and increased 16.6 per cent. The total wholesale value of motor vehicles manufactured in 1929 was $3,483,900,000, as against $3,045,820,000 in 1928, an increase of $438,080,000, or 12.6 per cent.

An increase of 20.2 per cent in the export business was achieved in 1929 as compared with 1928. Mr. Reeves' resumé is below.

Production

Cars and trucks produced in U. S. and Canada	5,651,000
Cars	4,846,000
Trucks	805,000
Production of closed cars	4,218,000
Per cent closed cars	87%
Wholesale value of cars	$2,952,900,000
Wholesale value of trucks	$531,000,000
Wholesale value of cars and trucks	$3,483,900,000
Average retail price of cars	$812
Average retail price of trucks	$877
Wholesale value of parts and accessories for replacement, also service equipment	$920,000,000
Tire production in U. S.	76,260,000
Wholesale value of rubber tires for replacement	$600,000,000

Registration

Motor vehicles registered in U. S. (From State Reports)	26,400,000
Motor cars	23,030,000
Motor trucks	3,370,000
Per cent gain in registration over 1928	8%
World registration of motor vehicles	34,700,000
Per cent of world's automobiles in U. S.	76%
Motor vehicle registration on farms	5,800,000
Miles of surfaced highway	660,000
Total miles of highways in U. S.	3,016,281
1929 highway and street expenditures	$2,000,000,000
Number of persons employed in motor vehicle and allied lines	4,300,000
Gasoline taxes	$415,000,000
Taxes on motor vehicles	$925,000,000

Automobile's Relation to Other Business

Number of carloads of automotive freight shipped over railroads in 1929	3,600,000
Rubber used by automobile industry	85%
Plate glass used by automobile industry	67%
Iron and steel used by automobile industry	19%
Copper used by automobile industry	15%
Lumber, hardwood, used by automobile industry	18%
Lead used by automobile industry	27%
Gasoline consumption by motor industry	80%
Gasoline used by motor vehicles, 1929 (bbl. of 42 gal.)	297,000,000
Crude rubber used by motor industry, 1929 (lb.)	913,920,000
Cotton fabric used in tires, 1929 (lb.)	287,000,000

Motor Truck and Motor Bus Use

Motor trucks in use	3,370,000
Motor truck owners	2,460,000
Motor buses in use	95,000
Consolidated schools using motor transportation	16,500
Buses used by consolidated schools	43.000
Buses used by street railways	11,500
Buses used by steam railroads	1,900
Street railways using motor buses	300
Steam railroads using motor buses	70
Railroads using trucks as part of shipping service	75
Motor trucks used by steam railroads	7,000

Foreign Sales

Number of American motor vehicles sold outside U. S. (U. S. exports and Canadian output)	1,015,000
Value of motor vehicles, parts and tires sold outside United States	$757,400,000
Per cent increase in foreign sales over 1928	23%
Per cent sold outside U. S.	18%
Motor vehicles imported, 1929	710

Motor Vehicle Retail Business in United States

Total car and truck dealers	56,300
Public garages	51,200
Service stations and repair shops	95,800
Supply stores	76,600
Gasoline filling stations	320,000
Gasoline pumps in use	610,000

Dodge Brothers Offers *Eight* and

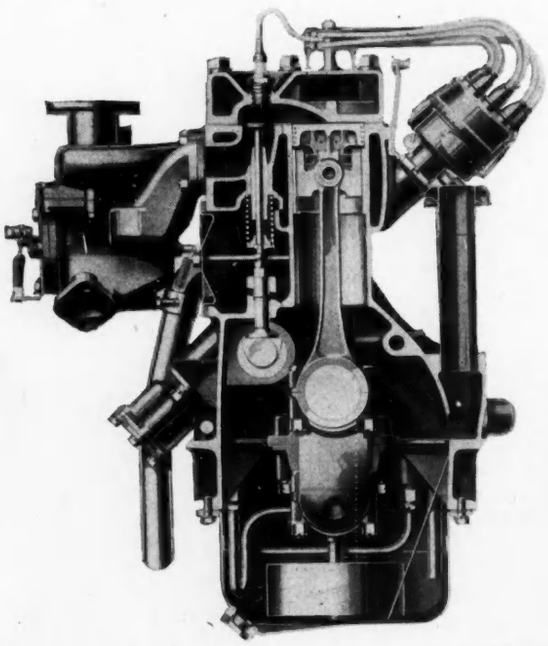
Four different lines now avail adjustable accelerator pump, vibration damper fea

WITH the introduction of two new cars at the New York Show, a six-cylinder model at a lower price, and an eight-in-line priced roughly between the present Dodge six and the Senior six, Dodge dealers will have available four different lines.

Characteristic of the two new Dodge cars are the all-steel bodies of a low-hung construction similar to that used on Dodge sixes since the introduction of the Victory six some time ago.

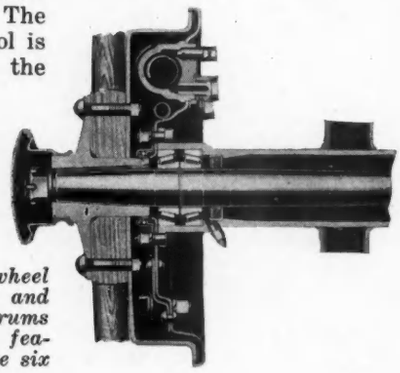
Both models have vertical hood louvers, but those on the eight are set in a curved panel. Cowl bands with parking lights are provided. Fenders are beaded along the center line. Three-speed transmissions are used on both cars. Radio wiring is provided on the Dodge eight, dealers handling Transitone radios for installation at extra cost.

Taking the eight-in-line first, this model has an L-head engine of 2⅞ by 4¼ in., engine developing 76 hp. At a car speed of 60 m.p.h. the engine speed is approximately 3200 r.p.m. The engine has a five-bearing crankshaft. A feature of the equipment is the downdraft carburetor with adjustable accelerator pump. Other noteworthy details include 2½-in. main bearings, vibration damper, aluminum-alloy pistons, a double-breaker distributor, a positive-shift Delco-Remy starting motor with steel ring gear, two-point front-end drive chain, with fan-belt drive for the generator and water pump (the latter integral with the fan mounting), extra large valves, and large water passages.



Sectional view of the new Dodge eight-in-line engine showing the downdraft carburetor, mounting, Bohnalite pistons, counterweighted crankshaft, crankcase ventilating system and inclined distributor and oil-pump drive

Distributor and oil-pump drive is by an inclined transverse shaft, the oil pump being externally located at the valve side of the block, but with no external oil leads, and the distributor being at the opposite side of the engine. Crankcase ventilation is of the suction type, with the outlet below the crankpan. Both an oil filter and an air cleaner are provided with the eight-in-line. The carburetor is of the plain-tube type with fixed jets, mixture control being by adjustment of the main metering pin. Dash control is provided for the manifold heat valve. The exhaust manifold has its outlet in the center, this arrangement being made possible by the overhead carburetor mounting. The manifold heat control is so designed that the valve should be kept closed only for cold weather operation and during warming up.



Double Timken wheel end-bearings and flanged brake drums and covers are features of the Dodge six improvements

The clutch is a Borg & Beck with spring-cushion drive and 9⅞-in. driving plates. Its release bearing is of the ball type. The engine is mounted on rubber at four points. Clutch adjustment is by means of the release fork. A set screw on the clutch pedal is provided for the adjustment of toe-board clearance.

In the transmission a roller pilot bearing and ball bearings on the main shaft are used, the countershaft being mounted on bronze bushings. Gear ratios are 1.79 to one in second, 2.15 to one in low, and 3.44 to one in reverse. Gears are of chrome steel.

Rear axles are entirely new and have an offset differential. This construction places the ring gear more nearly central between the differential bearings, thus dividing the load nearly equally between the two bearings. Double opposed Timken bearings are used at the wheel ends. The rear axle tread is 58 in., which permits of the use of wide bodies. Shim adjustment is used throughout in the rear axle. Differential side and pinion gears may be removed without removing the differential from the case.

The front axles also are new in design and have Elliott axle ends. This construction permits of a considerable strengthening of the center section ends, since the yokes are integral with it.

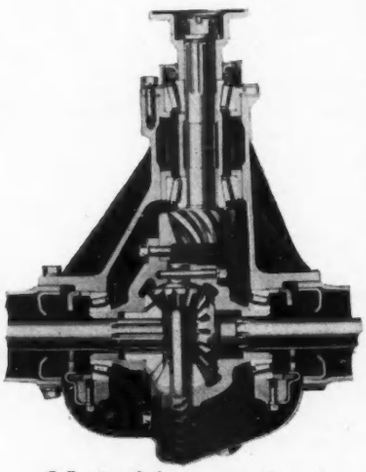
Improved *Six* for *1930*

able. Downdraft carburetor with aluminum alloy pistons and ture largest model.

Emblem of the new Dodge Brothers eight-in-line car

A master cylinder of new design is provided in connection with the hydraulic brakes, the supply tank being integral with the compensating master cylinder housing casting.

The powerplant of the new lower-priced Dodge six is also of the L-head type, with a four-bearing crankshaft, aluminum - alloy pistons, an updraft carburetor, etc. The crankshaft is counterweighted. With its bore and stroke of 3⅛ by 4⅛ in., the engine develops a maximum of 61 hp., it is claimed. Good hill climbing and acceleration are obtained through the use of the relatively high rear axle ratio of 4.9 to one, 5.00/19 in. tires being used.



Offset pinion mounting in the new Dodge six rear axle results in a better balancing of differential bearing loads by more nearly centralizing the ring gear

Piston pins are locked in the rod. The engine design in most respects is similar to that of the Dodge eight.

The A.C. fuel pump is used, and the carburetor is of Carter manufacture and provided with an external, adjustable, accelerating fuel pump. The transmission is of the three-speed variety, with ball-bearing mainshaft, and bronze bearings for the pilot and countershaft. Gear ratios are identical with those in the eight-cylinder transmission.

Springs are mounted in a similar manner as on the eight, but the shackles are of the metallic type and of Tryon manufacture. Frames are also similar in design to those used on the new eight, with the cross-member under the transmission, and the rear cross-member serving as a gas tank cover. There is no tubular member at the front end, however.

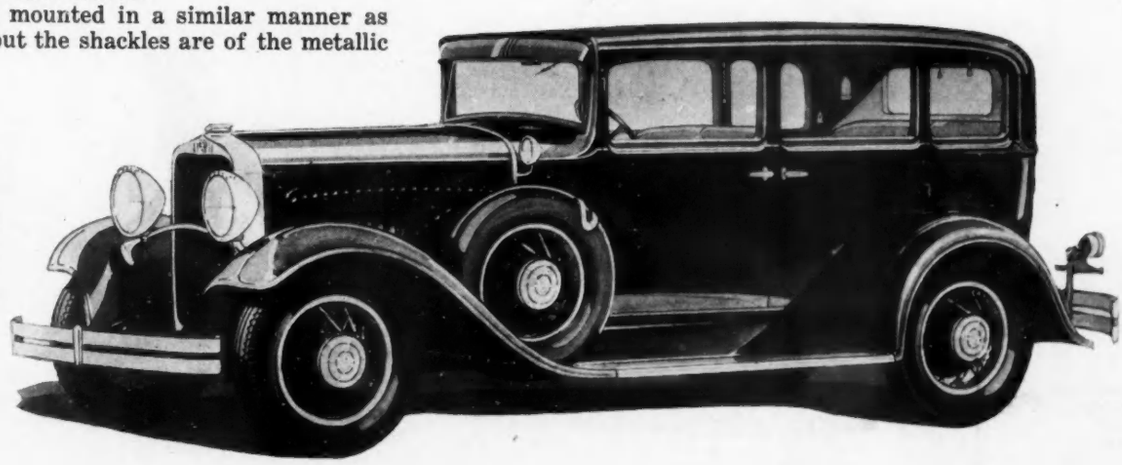
Brakes have the new type master cylinder, with integral supply tank just above it. Steering gears are of the worm and sector type, as on the eight.

Both the six and the eight have new flat vibrator type horns, located under the hood. Steering wheels are of the three-spoke type. There are two cowl ventilators in the sides. Headlight and throttle controls are on the steering wheel, while the engine temperature indicator and the gasoline gage are on the instrument panel. The windshield is of the vision-ventilating, sloping type. Front seats are adjustable. Rear traffic signals are standard on all models, as are windshield wipers.

South Bend Lathe Works Exhibit

THE South Bend Lathe Works will exhibit four new model back-geared screw-cutting engine lathes, at the National Automobile Show in New York.

These machines well represent the whole line of South Bend lathes, all of which are used for precision work in the manufacturing plant, tool room, machine shop and experimental laboratory. The exhibit will include demonstrations of typical service machining jobs.



Low-hung, long lines are characteristic of the new Dodge eight with their all-steel bodies. This view shows the four-door de luxe sedan

Oakland Announces *V-Eight* Series

New powerplant has horizontal valves, one-piece cylinder block and mounting which includes a synchronizer used to dampen excess road vibrations and torque reaction at low engine speeds.

THE Oakland for 1930 is a V-eight, and is known as the "Series 101." The Oakland Eight prices are as follows:

Rumble-seat roadster and 5-passenger phaeton	$1,025
Two-passenger coupe	1,045
Two-door sedan	1,065
Rumble-seat sport coupe	1,115
Four-door sedan	1,145
Custom sedan	1,195

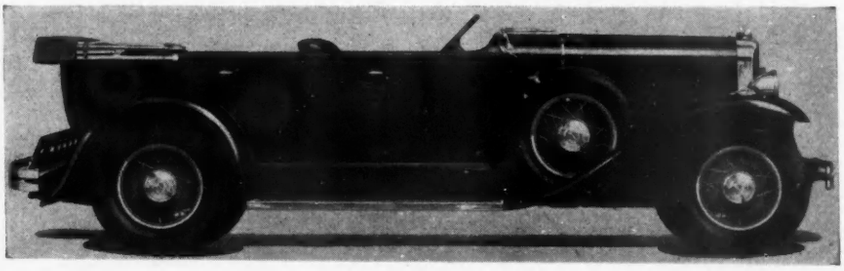
The wheelbase remains the same at 117 in. Smaller wheels and changes in the chassis and bodies have reduced the height 1¾ in. New appearance features include a V-shaped radiator front provided with a grill similar to that used last year, and a narrow, raised panel along the top of the hood, starting from the radiator and sweeping out gradually across the cowl to the windshield posts. The new model has a slanting windshield (to reduce reflections), arched window openings, metal roof-side panels, one-piece fenders, parking lights on the front fenders, and chromium-plated hood hinges and cowl bands.

Pressure lubrication has been extended to the piston pins. There is a water circulation control thermostat for quick warming up, while the circulation system itself includes a by-pass to provide continuous circulation during the warming-up period. Front axle I-beams change to a rounded section toward the ends, for better resistance to torque reaction. The valve spring dampers used last year are continued. Hyatt roller bearings are used at and in the road wheels and taper roller bearings in the steering gear. By the type of hook-up used, the emergency brake provides additional leverage on all four wheels after maximum application of the pedal.

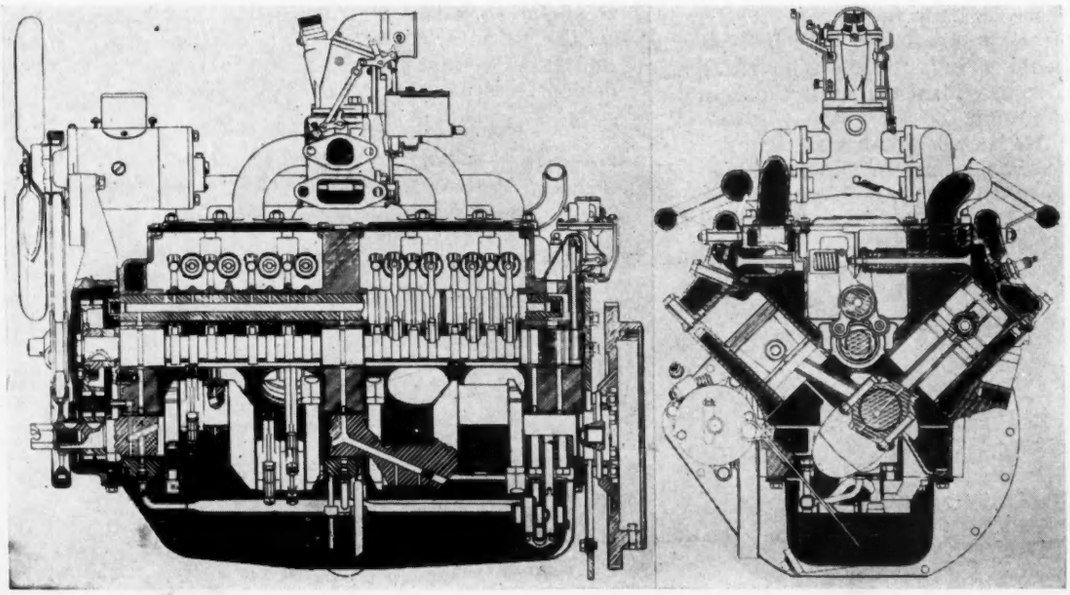
The engine has a bore and stroke of 3 7/16 by 3⅜ in., the short stroke adding further to the natural compactness of the V-type. Three main bearings are used on the crankshaft. The maximum output is 85 b.hp.

Further features of the engine worthy of study are the horizontal valves, one-piece cylinder block and crankcase, the 180-deg. crankshaft, the method of engine mounting and the synchronizer used to dampen excess vibration from road shocks and torque reaction at low engine speeds.

Unbalanced inertia forces often have been considered a primary disadvantage of the V-type of eight-cylinder engine, in which they result in a side-wise rocking motion of the powerplant, twice during each revolution of the crankshaft, unless balanced. The general prac-

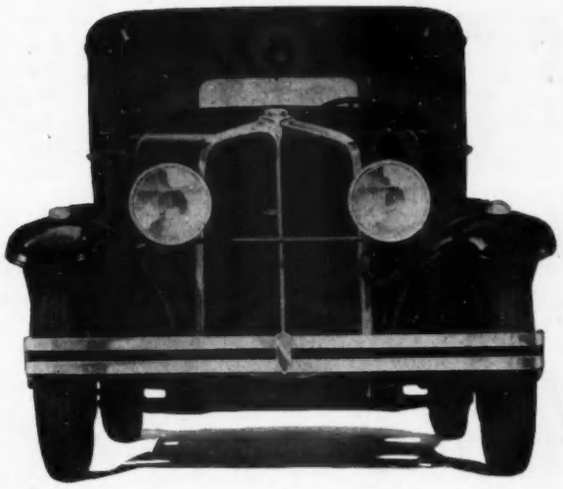


Oakland eight phaeton, with de luxe equipment



Transverse and vertical sections of the Oakland eight engine, showing the exceptionally short stroke, horizontal valves, single piece crankcase and cylinder block casting, and two-sided cylinder head. Note also the short passages from the downdraft carburetor

Priced up to $1,195



Front view of the Oakland eight, showing the fender lights which have a 120-deg. beam spread

tice in the past with V-eights has been to use a 90-deg. crankshaft, with which these inertia forces cancel out. Oakland engineers claim, however, that with the 180-deg. shaft which they have adopted, a better firing order and simpler manifolding are possible. However, in order to be able to use the 180-deg. shaft, that is, a crankshaft with all throws in one plane, a method of damping the unbalanced inertia forces had to be developed.

This consists in the use of a special method of mounting the engine and of a synchronizer. It was found, after considerable study, that the side-wise rocking motion of the engine was about an axis running diagonally from the top of the engine in front to the bottom of the transmission at the rear. This position of the axis is due to the fact that the center of gravity of the engine is slightly to the rear and above the center main bearing. This having been determined, the problem resolved itself into supporting the engine in such a manner that it would be free to rock about this axis and rigid in other directions, and then isolate the rocking motion.

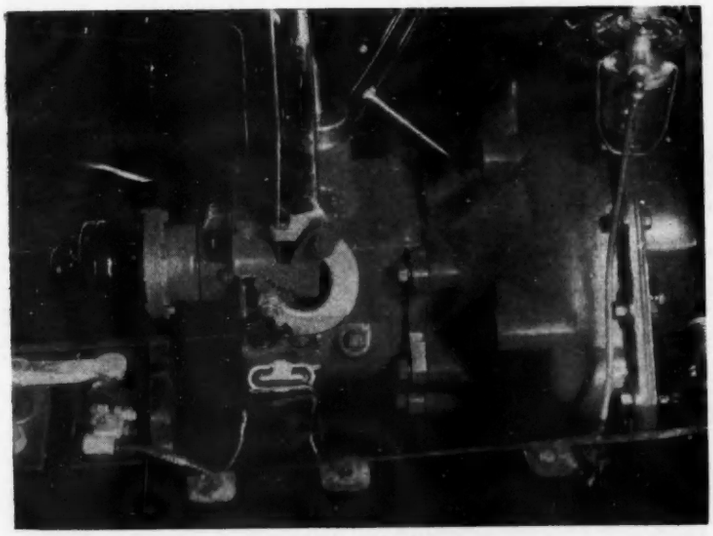
The illustrations of the front and rear engine mountings and the synchronizer show how this has been accomplished. At the front there are two points of support, on laminated springs. These springs are located in such a manner that they permit a rocking action of the front of the engine but provide a solid mounting as far as horizontal and vertical rigidity is concerned. At the rear there are two supports at the base of the transmission, which, however, act as a single support from the point of view of rocking motion, a trunnion-mounting effect being produced, and flexibility assured through the used of rubber C-shaped "bushings."

While this type of mounting produced very smooth operation at high road speeds, at low engine speeds and on rough roads the front end of the powerplant had too much freedom, and was easily affected by road shocks. A means was then developed which, while permitting the engine to follow its natural inclination to oscillate, prevents it from being moved about promiscuously in the chassis as a result of low-speed-torque reaction or violent road shocks. This is represented by the synchronizer found at the front end of the powerplant.

From the illustration it will be noted that it consists merely of a vertical arm pivoted at its lower end to the forward end of the crankcase and with its upper end contacting with a four-lobed cam on the camshaft. This arm actuates a horizontal rod extending to the frame. A spring on the rod maintains it in continuous contact with the rocker arm, the leverage of the latter and the height of the cam lobes being so proportioned that when the engine rocks to the right, the rod is forced by the cam to move exactly the same distance to the left, and vice versa. It will also be noted that in the attachment of the horizontal rod to the frame, pieces of friction material are used, the entire attachment being under a spring load.

Another feature of the Oakland engine is the downdraft carburetor, which with the horizontal valves results in a continuously downward or horizontal flow of the air and fuel from the inlet of the carburetor to the combustion chamber. Loading of the manifold is thus rendered impossible.

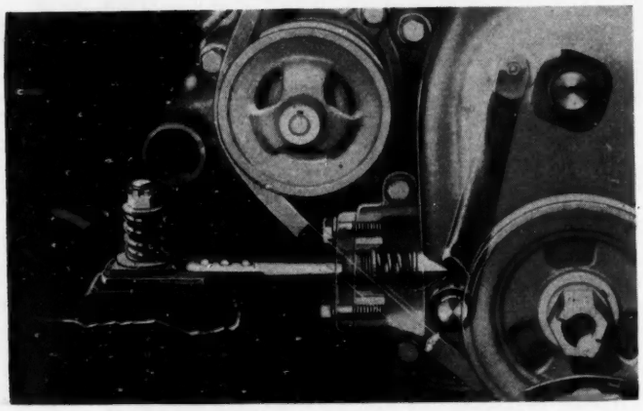
The vertical portion of the inlet manifold just below the carburetor has a separator wall which aids in dividing the charge between the manifolds for the two blocks, and it also has an exhaust jacket. By means of the heat control valve, the exhaust from the right-hand block can be passed upward and around the inlet pipe or else made to flow directly across into the exhaust manifold of the left-hand block. The heat control valve is connected to the throttle valve, so that while warming up the heat will be full on. The design of the heat jacket is such that there



This view of the transmission shows how the Oakland powerplant is supported in rubber at the rear. While there are two supports here, the effect torsionally is equivalent to that of trunnion mounting

will still be a considerable transmission of heat to the incoming gases after the warming-up period. There is also a seasonal adjustment in the valve control linkage, to enable more heat to be transferred during cold weather, while retaining the automatic adjustment.

As already mentioned, a by-pass is provided in the cooling system. This is always open, but since it has a fairly small diameter, with the thermostat open it has very little effect on circulation through the regular cooling circuit. With the thermostat closed, however, the increased pressure provides recirculation through this passage, which carries the water to the inlet side of the pump. The by-pass serves to prevent water be-



At low speeds and in case of road shocks, this "synchronizer," explained in the accompanying story, neutralizes and dampens out engine vibration

coming stagnant in the block and forming localized steam pockets during warming-up periods.

New features are also noted in the electrical system. The starter motor has a novel engagement. Depression of the starter pedal first pushes forward a sleeve. The latter compresses two coil springs which in turn push the pinion into engagement with the flywheel gear. The length of the springs is such that the electrical contact to start the motor cannot be made until the pinion is actually engaged. The pinion itself is mounted on splines in such a manner that when the foot pressure is relieved and the coil springs draw the pinion back, a collar will automatically lock the pinion in place on the shaft. There is also a cork brake on the outer end of the spline shaft. The distributor is of the double-breaker type, with two side outlets, one for each block.

The clutch has been increased in size to take care of the greater engine torque.

The steering gear is a new hour-glass worm and sector type, with the worm mounted on roller bearings. It has a ratio of 18 to 1 and carries a three-spoke steering wheel.

Delco-Remy hydraulic shock absorbers with link type connections are standard equipment on all models. The cross flow principle in the radiator is retained. A new vibrator type horn is mounted on the front fender tie-bar, just below the left head lamp. Ignition switches are contained in the ignition coil which is mounted in back of the panel. Instruments are individually mounted and include a 90-mile speedometer and a dash gasoline gage. There are no controls on the steering wheel except the horn button.

The wiring of the fender lights is so arranged that when head lights are switched to the depressed beam, the fender lights will also light up. As in city driving the depressed beam is used; this makes the presence of the car known to drivers approaching from the sides.

The Oakland front engine spring mountings permit the engine to rock about its neutral axis, while furnishing horizontal and vertical rigidity

Pontiac Lines Improved

ENGINEERING changes on the Pontiac are of a minor character, but the bodies have been dressed up materially. A half-oval belt molding has been added which, starting on the hood, runs back across the body side panels in a straight line and follows the belt line across the rear panel. A slanting windshield has been adopted and rubber cups are placed around brake and clutch pedals. Four-point engine mounting is now used, the mounting bolts being insulated by steel-armored rubber bushings. Metric spark plugs have been adopted. Lateral rigidity of the crankcase has been increased by the addition of full-length ribs on the outside of the case. The semi-positive-shift starting motor described in connection with the new Oakland Eight is also found on the Pontiac. Brake shoes have the new T section on the servo side. Rollers have been added to the toggle links through which the brakes are applied, to reduce friction. The emergency lever is now connected directly to the service brakes at the cross shaft in the same manner as on the new eight. The adoption of rods in place of brake cables makes possible the forcible release of the brakes in case they should not release automatically. Steering gears, as on the eight, are of the hour-glass worm and sector type. Front springs have lower deflection rates and new 10-spoke wheels have been adopted.

The radiator shell is somewhat narrower than last year. Ignition locks are now in unit with the cowl and mounted on the instrument board. Accelerator control has been improved by increasing the pedal travel between 25 and 35 m.p.h.

Budd Exhibits Steel Bodies

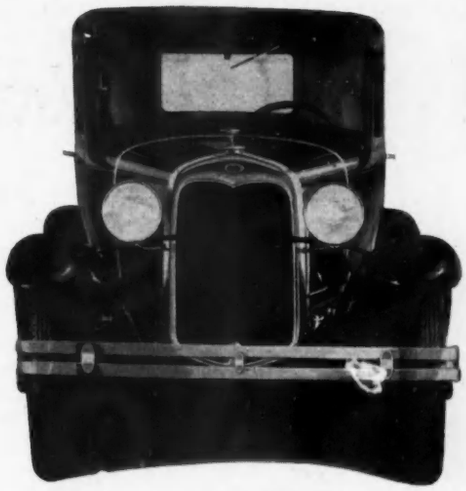
THE exhibit of the Edward G. Budd Manufacturing Co., of Philadelphia and Detroit, makers of all-steel automobile bodies, will consist of the following items at the New York Automobile Show:

The 1930 monopiece sedan body, one-half painted and trimmed and one-half unpainted to show the all-steel construction. The 1930 monopiece de luxe coupe, half painted and trimmed and half in the white.

There will also be displayed various Budd steel stampings mounted in frames for easy inspection.

Ford *Model A* Bodies *Have* Changed *Lines*

Wide use of rustless steel in cars shown this week by dealers. Mechanical details remain as in late design.



The front of the Ford Model A has been changed considerably

LARGER bodies and improved appearance, together with the use of rustless steel for exterior bright work, are features of the new model just announced by the Ford Motor Co. Prices remain unchanged and no mechanical improvements are announced at this time.

While the more attractive body lines are the center of attention, the use of rustless steel for the radiator shell, head lamps, hub caps, cowl finish strip and tail lamp are of equal importance. No details of this material are available at this time, but, as its name implies, it has non-tarnishing qualities and its use for exterior finish represents an innovation.

The external appearance has been improved by increasing the height of the radiator, the use of a cowl finishing strip or band, the use of fenders with a more pronounced sweepback and smaller wheels fitted with 19/4.75 tires.

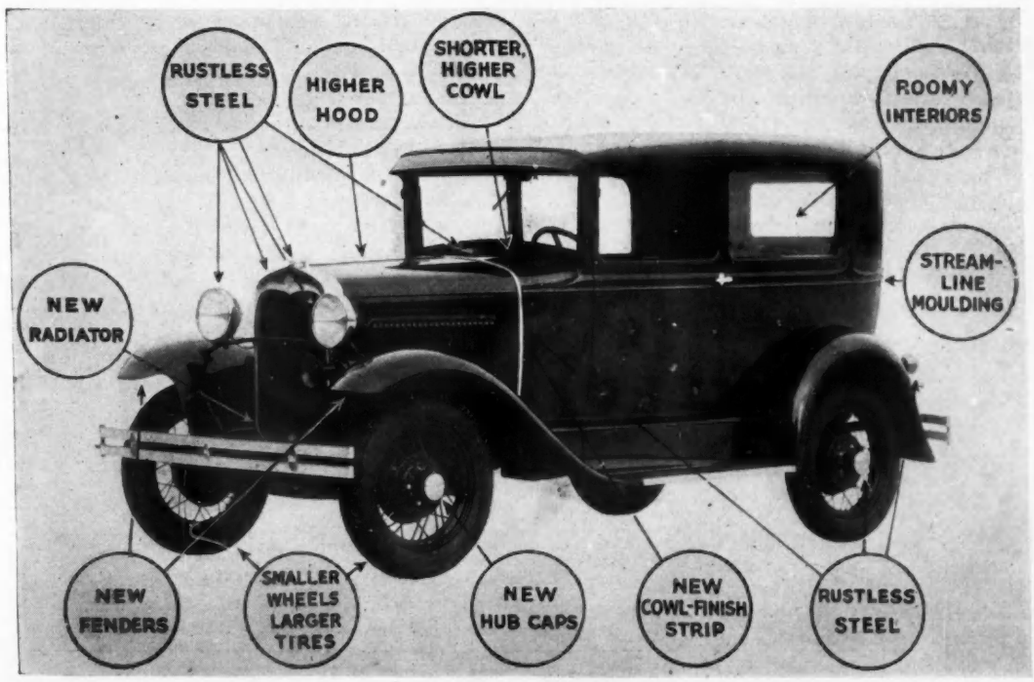
The deeper and narrower radiator gives practically a straight line to the hood and cowl, which is further emphasized by continuing the straight belt line over the sides of the hood. Hood louvers are now set in a panel, centralized in the sides of the hood instead of being offset to the rear, as on the previous model. The number of louvers has been increased from 19 to 22 to afford better cooling.

In the former series the windshield pillars were continued to the bottom of the door panels. In the new models, the hood cowl and side body panels are a smooth unbroken surface, windshield pillar lines stopping at the belt.

While no mechanical changes are included in the 1930 series many improvements have been made in these models since they were first introduced. Among such changes may be included the plate clutch, steering gear, piston pin retainer, emergency brakes, oil feed line, construction of the engine crankcase, generator, valve guides, rear main bearing, front engine support, etc.

Front fenders, as previously mentioned, are of the low incidence type and flare up from the sides of the chassis in a pleasing line to a higher elevation than formerly. Rear fenders are now carried to a point 2 in. lower than on the previous design so as to eliminate the splashing of mud on the bodies and fenders. Front bumpers, while resembling the previous design, are slightly arched but without the kick-back in front of the tires.

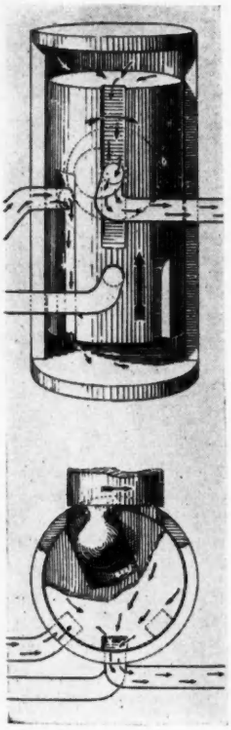
The roomier bodies have approximately 6 in. more interior length. This increase is obtained without changing the wheelbase of 103½ in. Throughout the line greater leg room and riding space has been achieved and adjustable front seats are a feature of all closed models. On the roadster the windshields are now of the forward folding type and upholstery is pleated.



Where the new Ford differs from the former models

Hudson Enters Eight Field and

Mechanical changes in both series include outline, vibration damper, im smaller wheels and



Drawing of double-acting oil pump for circulation of oil in crankcase of Hudson Great Eight

WITH the announcement of the Hudson Great Eight, the Hudson Motor Car Co. enters the eight-cylinder field. The Essex remains a six, but its wheelbase has been increased to 113 in. and its bodies have been made longer, lower and wider; with increased power, new appearance and numerous mechanical and body refinements the car is represented as of decidedly greater value than its predecessors.

The Hudson is being offered in two lengths of wheelbase, 119 and 125 in. Its bodies are entirely new and decidedly attractive, and they embody such features as door-type hood louvers, sloping windshields, small body-sill height, and a slightly narrowed radiator shell curving back at the top to merge into the double hood hinge, the latter combining with a false radiator cap and feathering at the base of the windshield to give the appearance of an arrow. Front doors now are hinged at the front, with concealed groove and tenon type hinges. Monroe double-acting hydraulic shock absorbers are standard equipment.

The Great Eight engine has a bore and stroke of 2¾ by 4½ in. which correspond with dimensions of the Essex. It has a five-bearing, fully-counterweighted crankshaft, the weights being forged integrally with the crank arms, and a Lanchester torsional vibration damper. Connecting rods are of the conventional I-section type, while the pistons are of aluminum alloy and carry four rings each. Of these the upper two are compression rings and have a groove cut in their face to form an oil seal against blow-bys, while the two lower rings are the usual oil-control rings.

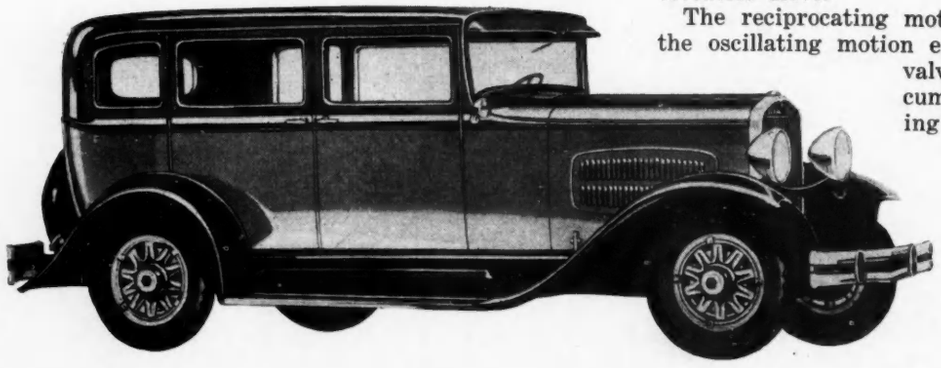
Cylinders are of the L-head type, and the combustion chambers are so designed that part of the incoming gases is caused to flow over the exhaust valve to cool it. Cylinder heads are split in the middle for accurate machining and ease of servicing. Crankcase upper halves are cast integrally with the block.

Many of the mechanical changes incorporated in the new Hudson Great Eight are found also on the 1930 Essex. These include the two-way oil flow and double-acting pump running at half engine speed, the new combustion chamber outline, spark timing quadrant on the distributor, Lanchester balancer, new crankcase ventilating system, three-bolt-flange attachment for the exhaust pipe to the manifold, ribbed front-axle ends, offset rear-axle pinion and circular bearing carrier yokes, smaller wheels, the new developments in frame construction, three-spoke steering wheel, ball-bearing steering spindles, universally-jointed tie rods and improved brake shoes.

In addition there are numerous other changes. Essex pistons now also have four rings, two grooved compression and two oil rings. The thickness of the babbitt in the connecting rod head has been decreased to 1/32 in. Crankpin diameters have been increased ⅛ in., and crank arms thickened. Power is said to have been increased approximately 10 per cent at 3400 r.p.m., owing to improvement in combustion chamber and manifolding design, and the use of a larger carburetor, 1¼ in. Automatic heat control is also provided on the Essex. Its Marvel carburetor is of the two-jet type, incorporating an accelerating pump and three-position linkage for seasonal temperature control.

Engine lubrication on the eight is similar in principle to that used on former Hudson-Essex cars, being of the splash type, with oil circulation through the splash troughs. It has been improved, however, by using two-directional flow, from both the front and rear toward the center. This was made possible by the development of a new double-acting piston pump, the piston of which is given both a rotating and an oscillating motion by an eccentric drive.

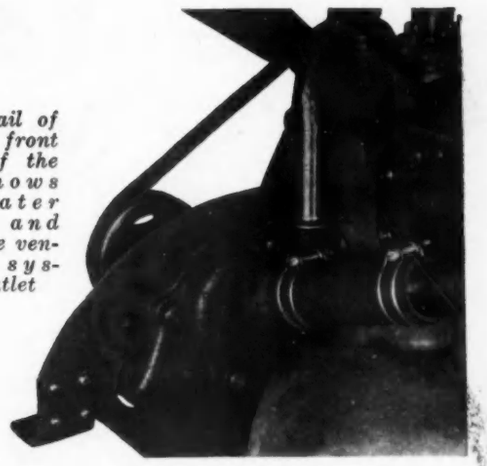
The reciprocating motion does the pumping, while the oscillating motion enables the piston to perform valve functions. In the piston circumference slots are milled forming oil passages from ports in the



This Essex Challenger touring sedan shows the characteristic lines of the 1930 models. Bodies are both longer and wider

Essex Power *is Increased*

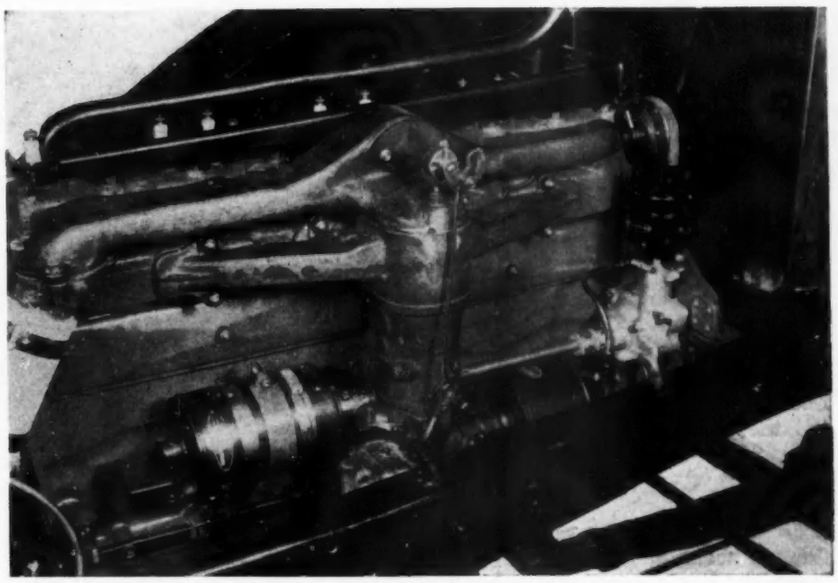
two-way oil flow, new combustion chamber proved crankcase ventilation, body refinements.



This detail of the left front corner of the Essex shows the water pump and crankcase ventilating system outlet

cylinder wall to the pumping chamber. For instance, when the piston is at the top of its stroke, one slot connects the upper chamber to the crankcase suction line, while another connects the full lower chamber to one of the two outlet lines. The piston now starts down. Near the bottom of its stroke it begins to rotate also, shutting off communication between the upper chamber and the suction line and between the lower chamber and the delivery line, opening the lower part of the chamber to the crankcase suction line and the upper part to the second discharge line. The piston starts up again, sucking oil in at the bottom and pumping it out at the top, and the cycle repeats. Curiously enough, it was found that by allowing the port openings to overlap somewhat, the oil flow was increased, although it might be assumed that some of the oil would be pumped back into the suction line.

This oil pump is located outside the crankcase near the engine right front support, and derives its motion from the three-point Morse chain drive of the camshaft. The generator is driven from the oil pump driveshaft through a tubular shaft with rubber hose connections. The distributor is driven by worm gearing off the same shaft. The latter unit is provided with means for quickly changing the spark setting, a quadrant graduated in degrees being provided in the mounting. A double breaker is used.



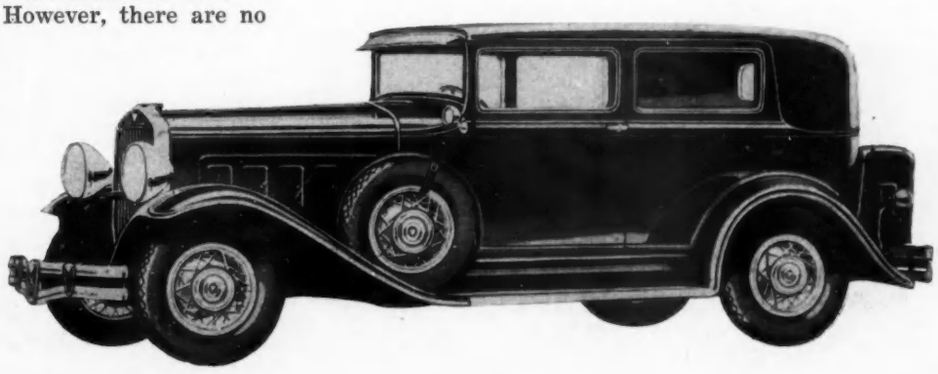
Right side view of the Hudson engine, showing the automatic heat control, exceptionally large manifold riser and generator drive. Note the oil pump below the distributor near the front engine mounting

A V-belt drives the fan and water pump. Fan adjustment is by means of a swinging bracket; chain adjustment, by means of an eccentric accessory-shaft mounting. Bendix starter drive is used, with a steel ring shrunk on the flywheel.

Inlet manifolding is similar to that on former Hudson-Essex models, with part of the manifold cast in the block and water-jacketed. However, there are no baffles or deflectors in the inlet passages. The manifold itself is of the four-port type, and is equipped with an automatic heat control around the riser and central portion. The carburetor is a 1½-in. Marvel with seasonal adjustment in addition to the automatic heat control.

Two breathers are mounted on the left side of the crankcase, at the front and rear respectively, of the general form of ship ventilators. Their outlets are

(Continued on page 25)



Hudson Great Eight coach with de luxe equipment. The chassis is offered in a 119 and 126-in. wheelbase

Gardner Enters Front-Wheel With Six-Cylinder Engine

Show model to be equipped with Conti reserves decision as to make to be clutch, special transmission

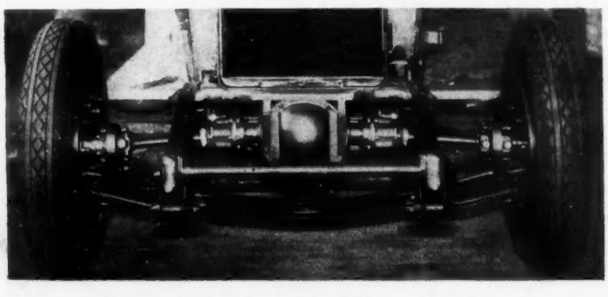
By M. WARREN

THE Gardner Motor Car Co., St. Louis, has entered the front-wheel drive passenger car field with a six-cylinder car of 133-in. wheelbase and with a Baker-Raulang body, which will be displayed at the New York show. Mechanically the car resembles conventional design more than is usual with front-drive vehicles. The engine, of course, is turned end for end, but the clutch, transmission and differential are all of usual types. A standard spiral bevel gear drive is used. Prices have not yet been fixed but the car will range in the $2,000 class.

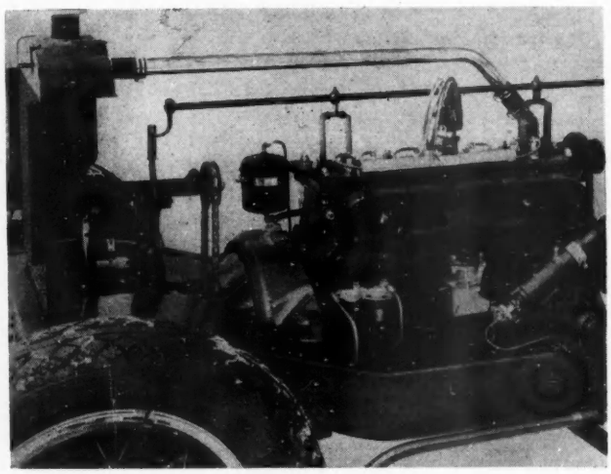
The engine which powers the car to be exhibited is a Continental 11-E having a bore and stroke of 3⅜ by 4⅝ in. and developing 80 hp. at 2900 r.p.m. With regard to this and all other parts, however, the company reserves its decision as to the makes to be used in production.

Transmission units include a Borg & Beck clutch with ball-bearing pilot, a three-speed transmission of Gardner design and built with gears and shafts furnished by the Warner Gear Co., and a differential and front-axle assembly manufactured by the Universal Products Co. Lockheed internal hydraulic four-wheel brakes are fitted, the front brakes acting directly on the wheels. The emergency brake is mechanical and acts on the rear wheels only.

The differential is located directly underneath the radiator. Power is transmitted from it to each of the front wheels through a short driveshaft with a universal joint at each end. The gear ratio of the final drive is 4.6 to 1. The I-beam section drop-forged front axle is bowed forward so as to clear the differential housing when the springs are compressed. The pinion shaft of the final drive gear is also the transmission main driveshaft. As in other front-drive designs, gearshifting is accomplished by means of a rod running back over the top of the engine and through the dash, which connects to the shift lever by an arm with a ball-and-socket joint and at the rear end carries a ball handle. Selective engagement is effected by turning the handle and sliding it fore or aft. The shift is the complete reverse of standard practice, low-speed being to the left and forward and high to the right and forward.



Front axle of the Gardner for 1930



Left side of Gardner powerplant, showing gear shift lever and fan-drive detail

Cooling water is circulated by a chain-driven centrifugal pump, the circulation being thermostatically controlled. The cellular radiator core is located behind a grill which fills in openings in the radiator shell. Owing to the scoop-like construction of the front splash pan, air is being taken in below the shell also, which adds to the efficacy of the core.

Engine accessories include a 1¼-in. Schebler carburetor, an AC fuel pump, a Purolator and a Delco-Remy electric system. The battery is located at the right side of the engine just inside the hood ledge, and is made unusually narrow and deep to conform to the space available for it.

The steering column is adjustable and is equipped with a three-spoked hard-rubber, steel-insert wheel of 18 in. diameter. Only throttle and light-control levers are mounted on the wheel, the spark, starter and choke controls being mounted on the instrument panel, all three being operated by pull-out buttons.

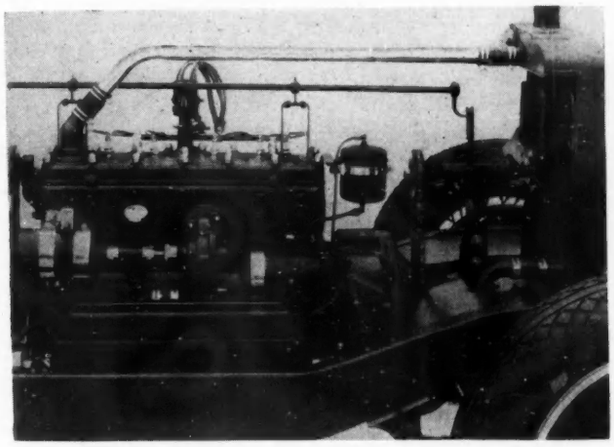
Elimination of the usual starter pedal and gearshift lever and location of the brake lever to the left of the driver's seat has resulted in a front compartment virtually free from obstructions.

Front springs are 38 by 2 in. and rear springs 54 by 2 in. The frame has side rails of 5/32 in. stock,

Drive Passenger Car Field and Baker-Raulang Body

nental 11-E powerplant, but company used in production. Borg & Beck and Lockheed brakes used.

BAKER



Right side of Continental engine used in show model of Gardner front-drive car

6 in. deep and with 2-in. flanges. There are six cross-members, of which that at the center of the chassis is of box-type. The rear axle is an I-section drop-forging which is slightly cranked under the rear springs to maintain the road clearance at the center of the track. The tread is 58 in. at the rear and 56½ in. in front. The overall height of the car is 65 in. It has a road clearance of 10 in. and a turning radius of 18 ft. Six-inch tires are used on 19-in. rims, and the weight of the car is approximately 3000 lb.

The body is virtually without moldings. There are individual reveals on each door and on the back panel. The openings in the radiator shell or shroud are filled with chromium-plated bronze grills, except for the recessed belts and sides and the spear-shaped metal strip which divides the grill into two sections. The shroud is painted in the same color as the body. There are radiator shutters inside the shroud and close up against the radiator core but these are practically invisible from the outside. The body is comparatively wide and its sides drop down over the frame to a level with the running board, thus eliminating side splash aprons.

The front seat is adjustable and has plain pillow-type upholstery. Body hardware is of brushed silver and interior fittings include a chromium-plated dome light, robe rail, two toilet cases, arm loops of broadcloth to match upholstery. In addition, there are three silk curtains on the two corner lights and the back light in a color to match the upholstery. There are carpets front and rear of the same color as the upholstery.

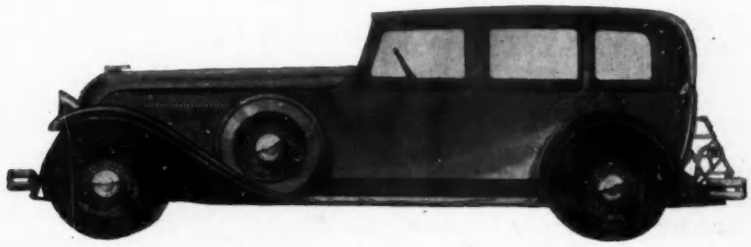
Fenders are of the full crown seamless type. There is a special radiator cap design to carry out the line of shroud and body. Metal instrument panel is grained in walnut.

The windshield is slanting and is a mono-controlled type operated by a simple mechanism in the center of the cowl bar. Fenders and splash pans are carried in color. Wire wheels are green with chromium rims and hubs.

The roof has full metal sides and the top is finished in imitation landau leather. A trunk rack is supplied on the rear. Combination tail and stop light is supported by a tubular section with all wire concealed. There are no parking lights, but on either side of the radiator and mounted on the front spring horns between the fenders and radiator are twin horns that resemble parking lights in appearance. The rear of the car including the gas tank is completely covered with a rear spring pan.

The body is provided with a built-in radio aerial and space for radio attachment. Running boards are of mahogany finished wood, fluted and molded with chromium strips. All external hardware is chromium plated. There is a large size cowl ventilator in the closed models.

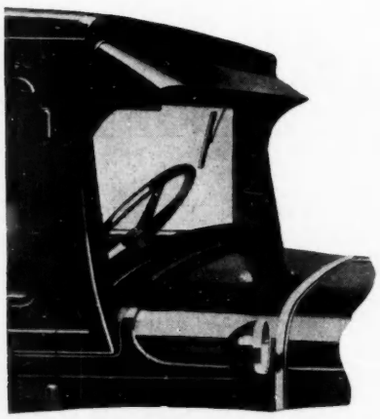
The header is a finished panel with a visor of the interior type. Headlights are large and in harmony with the characteristic front of the car and are supported from the fenders on chromium-plated brackets by a tie rod through the radiator shroud. The front splash pan is designed to conform to the radiator shroud and carries the name plate, no name appearing elsewhere on the car. Fender wells are provided on either side for spare tires. All front end mechanism is covered so that, except for the unusual hood length, the front-drive construction is not accentuated.



Baker-Raulang designed the Gardner front-drive bodies

All 1930 Chevrolet Models More Power, Heavier Axles

Sport roadster, sport coupe and club during Christmas season. Com wheels with increased tire sec



Detail of Chevrolet closed car, showing slanting windshield

NUMEROUS improvements have been made in the new Chevrolet models, placed in the hands of dealers at around Christmas time. In making the announcement, W. S. Knudsen, president and general manager, said he anticipated a volume of business equal to if not surpassing that of the record year, 1929.

There are eight body models in the line, three open and five closed. The open models include a phaeton, a roadster and a sport roadster, the latter an addition to the line. The closed models consist of a coach, sedan, coupe, sport coupe and club sedan. The latter two also are new body models.

Body features include the Fisher VV sloping windshield, a new instrument panel with a dash gasoline gage in addition to the equipment previously carried, and altered window reveal outlines. The disk wheels are fitted with larger hub caps and carry tires of larger section, which further improves the appearance of the car. The principal mechanical changes may be summarized as follows:

1. A completely new braking system, with independently operated service and emergency brakes.
2. A heavier rear axle.
3. Increased power.
4. Larger section tires and smaller wheels.
5. Improved engine lubrication.
6. Hydraulic shock absorbers as standard equipment.
7. Lighter pistons and clutches.

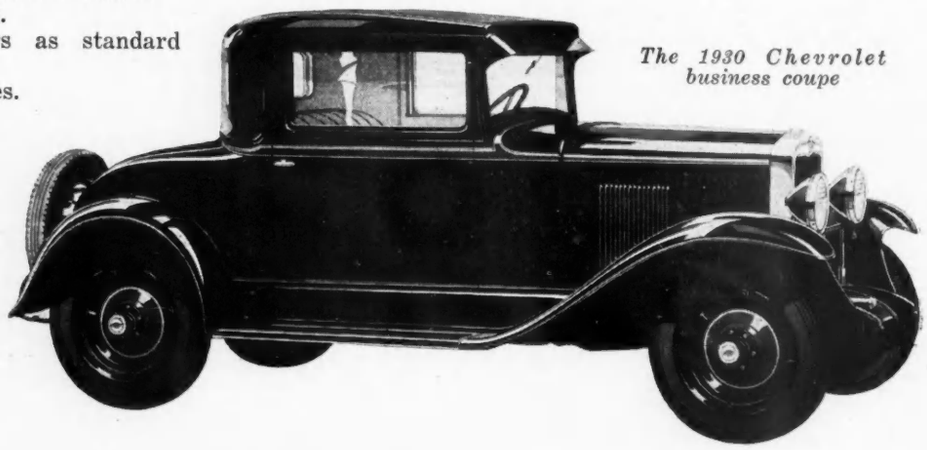
In the powerplant the most notable change is an increase in power to 50 hp. at 2600 r.p.m. and 24.5 hp. at 1000 r.p.m. This gain is due to a change in valve sizes, the head diameter of the inlet valves having been increased 3/64 in., and that of the exhaust valves decreased an equal amount; a larger carburetor venturi (15/16 in.), detail manifold improvements and a cooler air intake. The heat jacket on the inlet manifold has been enlarged and now surrounds not only the riser but the entire T. This has permitted reducing the size of the carburetor jet and increasing fuel economy.

In the carburetor the accelerating pump now is made with a smaller bore but longer stroke, to give a more nearly uniform fuel discharge. While the position of the air cleaner has not been changed, the air now enters it from the front, and the intake therefore is assisted by the fan blast; moreover, the air no longer comes in contact with the exhaust pipe immediately back of the carburetor before entering the cleaner.

The Chevrolet front brake assembly

Cast iron pistons are now lighter than last year and the piston bosses are lined with bronze bushings. Crankshaft main bearings are of the steel-back, babbitt-lined type. The capacity of the oil pump has been increased about 30 per cent.

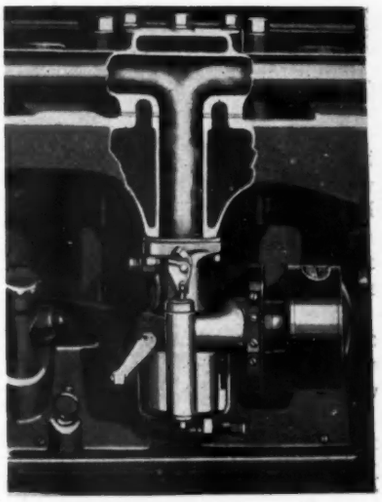
The clutch spinning weight has been reduced by lightening the hub. Rear axles are more rugged all the way through than in last year's model. The pinion is now forged onto its shaft, the final drive gears are heavier and give a slightly greater reduction, and the differential carrier is provided with an oil scoop as an aid in the lubrication of the pinion-shaft bearings. The axle



The 1930 Chevrolet business coupe

Have Hydraulic Shock Absorbers and Refinements in Design

sedan are additional bodies shown
plete new braking system, smaller
tions are features this year.



Cutaway of the 1930 Chevrolet manifold showing the heater jacket surrounding the entire T of the inlet manifold. Note the new air cleaner shape and longer accelerating pump

center housing design has been changed in accordance with the changes in the parts which it houses.

Brakes are now of the Huck type. The service brakes have two shoes per wheel, the upper shoe being articulated and therefore self-centering. Molded lining is used. Adjustments are located on the brake-backing plates. The emergency brakes comprise two separate shoes in each wheel, in the same drums as the service brakes, these drums being 11½ in. in diameter. The linkages for service and emergency brakes are entirely distinct.

The rear brake assembly, with the two extra shoes for the emergency

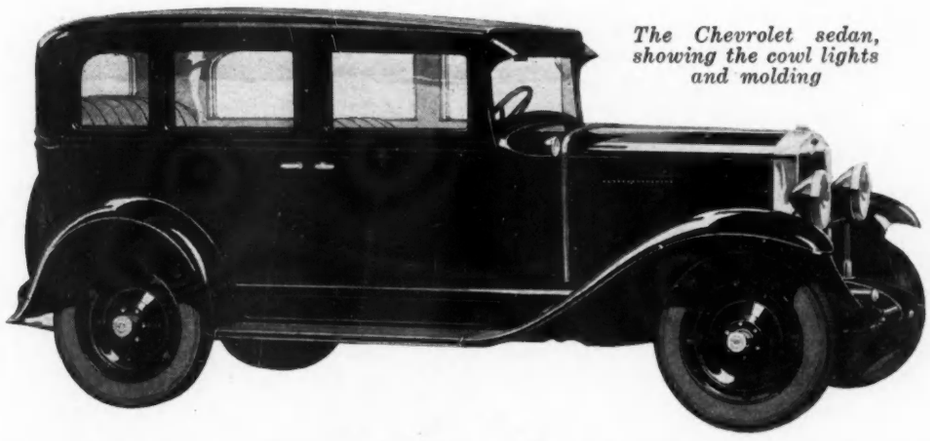
Service brakes are applied through a single cross shaft located amidships and hung from frame brackets by means of links which are pinned to the brackets through rubber bushings. This flexible mounting of the cross shaft serves to equalize the forces of brake application between all four wheels. In view of the floating mounting of the shaft, the connection from the pedal to the cross shaft is of the parallelogram type.

Connections from the forward brake rods to the front brakes are by cables. Rear wheel brakes are rod-operated. The linkage for the emergency brakes consists of two short cross-shafts at the rear axle, connected to an equalizer at the emergency lever.

Tryon spring shackles and Delco-Lovejoy hydraulic one-way shock absorbers with solid link connections have been adopted as standard equipment.

The electric gasoline gage is of a new type introduced by AC. It has two floats which are connected together, the rheostat control lever being attached to the center of the connecting member. In this way the effects of surge and inclination of the gas tank on the indicator reading are greatly reduced.

Wheels are now 19 in. in diameter, and take 4.75/19 in. tires, so that although the wheel size has been decreased, the rolling diameter has not been greatly affected. Disk wheels are standard, except on the sport roadster and sport coupe, on which demountable wire wheels with drop center rims are furnished.



The Chevrolet sedan, showing the cowl lights and molding

Rubber bumpers are applied to the upturned flange of the fender skirt serving as backing for the lower hood edge. This serves to prevent rattle.

All instruments are mounted on a single panel of new design, which is assembled from the rear. Spark, throttle and choke controls are located on the instrument board. The headlight beam depressor switch is retained on the toe board for foot-operation, leaving only the horn on the steering wheel.

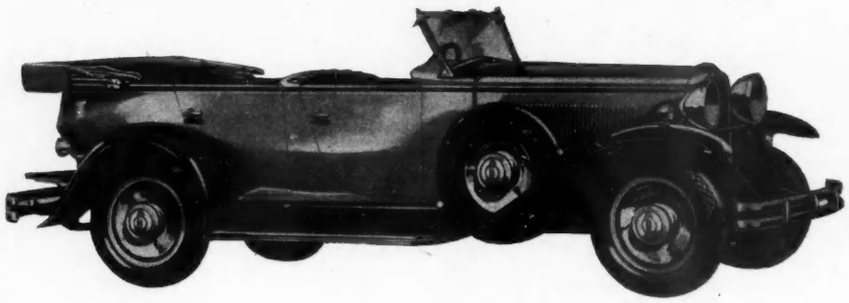
The various changes and improvements in the engines already described apply also to both commercial chassis, the light delivery and the 1½-ton truck.

Hupmobile Line Increased by Two

Prices on the Model H series range from $1985 to $2145. Downdraft carburetor and oil cooling are introduced in additional models for 1930.

TO the two Hupmobiles announced during the fall months, the six and the Century eight, there have now been added two further lines, the Model H, a 133-hp. straight-eight, and the Model U, which embodies the same chassis units as the Model H with a longer wheelbase.

The performance of the car was demonstrated during a ride in a sedan weighing 4410 lb., in a test when it carried a load of five passengers, the speedometer registered more than 90 m.p.h. maximum speed and better than 60 m.p.h. in second gear.



The Hupmobile Model H phaeton has an unusual rear end shape

Prices on the Model H line are as follows:

Five-passenger four-door sedan	$1,985
Five-passenger four-door town sedan	2,145
Two-four-passenger coupe	1,985
Two-four-passenger convertible cabriolet	2,060
Chassis	1,495
Victoria coupe	1,985

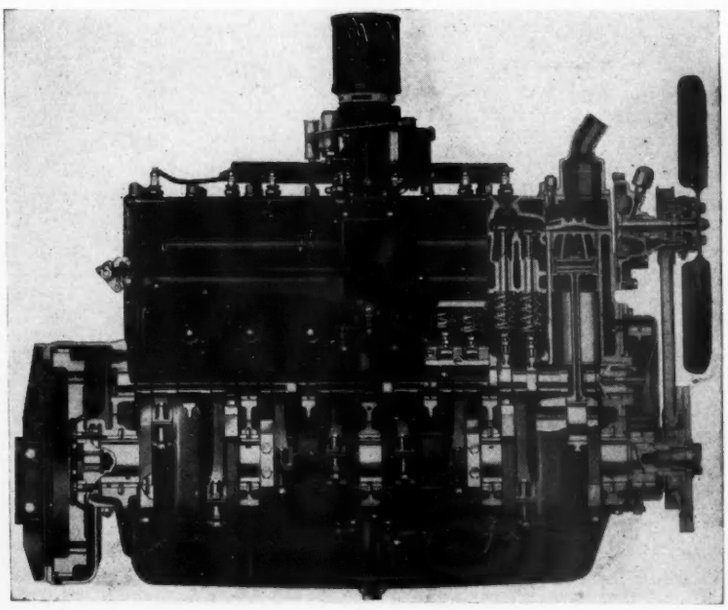
All prices are with standard artillery wheel equipment, except on the town sedan. The latter is equipped with six disk wheels, trunk rack, trunk and other de luxe equipment. Six disk wheels on other models, with custom equipment, lists at $85 extra. The same equipment with six wire wheels or six demountable wood wheels is $110 above standard list ($35 on the town sedan).

Body models offered on the Model U chassis include a seven-passenger sedan and a sedan limousine on which prices have not yet been given out. The novel features on these body models include slanting front doors, parallel with the 15-deg. windshield, these doors being of exceptional width and opening from the front.

The component of greatest interest in this new model is the 3½ by 4¾-in. engine, which includes downdraft carburetion and oil cooling. With the downdraft carburetor the peak horsepower is increased beyond that obtainable with an updraft instrument, and the maximum torque also is increased. In hill-climbing the downdraft carburetor adds to the power of the engine because it is located in a cooler position and therefore assures a higher volumetric efficiency. Another advantage claimed for this method of carburetion is that it makes starting easier.

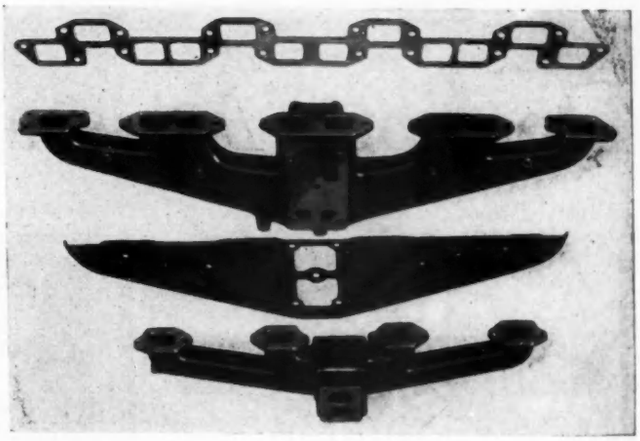
Oil cooling is a natural result of the high horsepower developed. As the power increases, the oil temperature generally goes up, and eventually a danger point is reached. In the new Hupmobile this is taken care of by partitioning off 2 in. of the water radiator core at the left side, supplying this section with separate header tanks at top and bottom, and using it for cooling the oil. It is claimed that by this means the oil temperature at the main bearings has been reduced from a possible peak of 260 deg. to below 200 deg. Fahr. under the severest conditions.

Oil is forced through this radiator under pressure by a separate pump, but the lead line has a pressure relief valve in it to prevent excess pressures being built

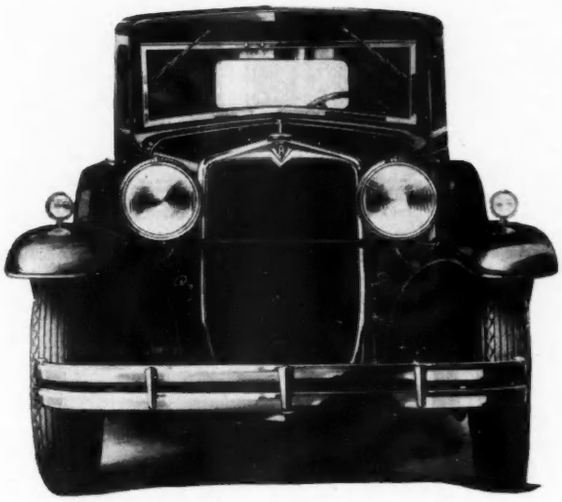


Longitudinal section of the Hupmobile Model H eight-cylinder engine, which develops 133 hp. Note the downdraft carburetor, with fumer, ribbed cylinder head and central exhaust pipe attachment

Eights This Year



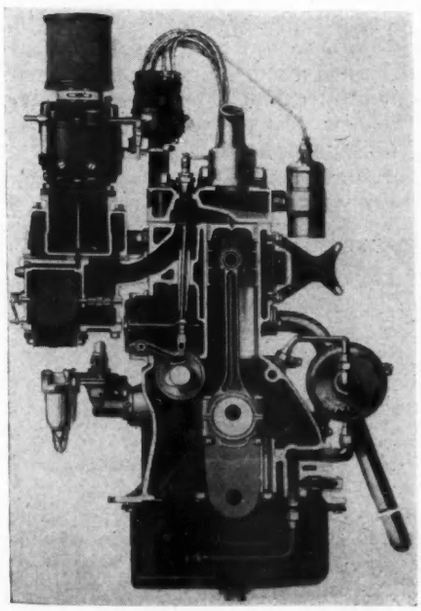
These four pieces make up the main part of the manifolding. At the top is the inlet double manifold. The next piece is a separator between exhaust and inlet to prevent undesired transfer of heat to the inlet manifold, the third is the exhaust, and the lowest the port gasket, made up in one piece



The peaked effect first introduced on the Hupmobile Model C is carried out also on the Model H

up in the core. Engine lubrication is by pressure feed to main, crankpin and camshaft bearings, to piston pins through drilled rods, to the cylinder walls through squirt holes in the connecting rod's big end, and to the rocker-arm-type valve lifters and distributor shaft bearing.

Crankshafts are fitted with eight counterweights, have five large bearings and are equipped with a Lanchester damper at the front end. Connecting rods are webbed at the bottom for cooling. Pistons are all aluminum, of Ray-Day manufacture. These units, which were described in these columns some time ago, are claimed to have an inherently low skirt expansion. This is due to separating the skirt from the head except for two supports which connect the head with the inner ends of the pin bosses. Circular internal ribbing is said to keep the skirt round under expansion. Since much of the heat in this piston design is dissipated through the head itself, five rings are provided, the top four being of the "tungtite" design.



Transverse section of the Hupp H engine. Note the valve lifters, double valve springs, two-butterfly manifold heat control

Valves are inclined to permit of longer bearings for the stems. Valve lifters are of the rocker-arm type with a multiplication of 6 to 5 due to the shape of the cam follower and lifter contour.

Camshafts are supported in steel-backed, babbitt-lined bushings. Combustion chambers are partially profiled, and have the metric spark plug set near the exhaust valve. Cylinder heads over the combustion chamber are ribbed in the water jacket to prevent drumming and also to increase cooling and thereby reduce the tendency toward detonation. At 3400 r.p.m. the engine develops nearly 37 hp. per cu. in. of piston displacement at 3400 r.p.m. with a compression ratio of only 5.2 to 1.

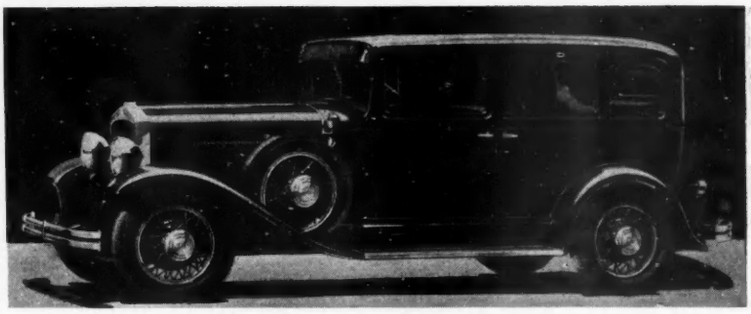
Interesting developments are found also in the manifolding. There is a double butterfly heat-control valve for the inlet manifold jacket, to positively control the flow of exhaust gases with valves open or closed. A downdraft carburetor being used, the exhaust pipe connects to the exhaust manifold at the center. A ribbed pressed steel separator is inserted between the exhaust and inlet manifolds, with copper asbestos gaskets separating it from both. This design materially helps to control the heat transfer to the inlet gases, keeping the manifold cooler and making the jacket more effective.

The inlet manifold is of the dual type, and the carburetor a double-venturi Stromberg. The latter unit has attached to it an "As-Ke" fumer, of interesting design. It incorporates a magnetic valve which is connected to the starter switch. When the latter is closed, a solenoid pulls down a spring-loaded piston, uncovering a hole which connects the fumer to the float chamber, below the fuel level line, so that gasoline will run into the fumer and be vaporized.

Further details of the engine include a front-end drive chain, a combination fan and pump unit driven by belt, thermostatic radiator shutter water temperature control, semi-automatic spark advance with a double-breaker distributor, a chain-driven generator, a full-flow oil filter, and a screened air inlet for the crankcase ventilating system.

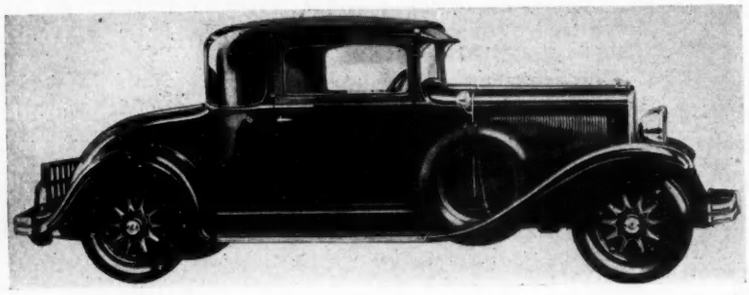
De Soto Adds an Eight for 1930

Larger engine introduced to sell in the $1,000 price field, with the six continued. Higher prices announced for the Chrysler 66 and 70. Many refinements added to line.



De Soto Eight de luxe sedan

ANOTHER line making its first appearance as a straight eight is the De Soto. This new eight is equipped with a 2⅞ by 4-in. engine (207.7 cu. in. displacement), mounted in a chassis of 163-in. overall length, and is designed to sell in the $1,000 price field. The De Soto six remains virtually unchanged and will continue to be furnished in seven body styles. There will be seven body models also



Chrysler 77 business coupe

on the De Soto eight with prices as follows:

Standard sedan	$995	De luxe coupe	$1,025
Business coupe	965	De luxe sedan	1,065
Roadster	905	Phaeton	1,035

The carburetor is of the downdraft type and is provided with an automatic accelerator pump. The intake manifold is mounted over the exhaust manifold and is fitted with a butterfly-type heat control valve. By reason of the use of a downdraft carburetor, the exhaust pipe is connected to the center of the exhaust manifold. The interrupter has a four-lobed cam and a double breaker arm. Spark plugs are of the metric type.

Smoothness of operation is obtained by carefully balancing the five-bearing crankshaft and providing an impulse-neutralizer at the front end. The engine is supported at four points, rubber being used.

A silent timing chain drives only the six-bearing camshaft, the generator being driven by the fan belt. The water pump is combined with the fan. A thermostat is mounted in the upper water connection.

The externally-mounted oil pump, driven from the lower end of the transversely-inclined distributor shaft, supplies oil through drilled passages in the cylinder block to crankshaft, camshaft and rod bearings.

Drive to the three-speed transmission is through a single-plate clutch with coil springs and damping plates in the driven member. Two ball-and-trunnion-type universal joints are incorporated in the 2-in. propeller shaft. A reduction of 4.9 to 1 is provided in the semi-floating rear axle. Driving reactions are taken by the semi-elliptic rear springs which are 54⅝ in. long and mounted in rubber shackles. Hydraulic shock absorbers are standard. Service brakes are hydraulic, the shoes expanding in 11-in. drums. A contracting brake on the driveshaft is used for parking.

Chrysler Has More Power

Greater power in the 66 and 70 models, body refinements and higher prices on the Series 70 feature the showing of Chrysler cars at New York. The power of the 70 Series has been increased to 93 hp., the engine specifications now corresponding to those of the former 77 series. The bore and stroke are now 3⅜ by 5 in., as against 3⅛ by 4¾ in. on the former 70 series.

On the Model 66, 68 hp. is now obtained by an increase of ½ in. in the length of stroke, its engine specifications now corresponding generally to those of the former 70 series. The new 70 engine, as well as that used in the Series 77, has a downdraft carburetor, while a normal carburetor is used on the 66. A larger counterweighted crankshaft, equipped with a vibration damper, is used in the 66. "Multi-range" four-speed transmissions are found on the 70 and 77.

Body changes include the adoption, on closed models, of vertical hood louvers instead of the "pennon" type used since last summer, open models retaining the "pennon" type; the adoption of chrome-plated cowl bands and of cowl-mounting of parking lights. Thermostatic radiator shutters have been added on the 70.

A further feature of the Chrysler 70 and 77 models is that they are now wired for radio installation, Chyrsler distributors carrying Transitone sets for installation at additional cost.

Prices are unchanged, except on the 70, on which all prices are increased $50. The new convertible coupe on this chassis, recently added, lists at $1,525.

Willys-Overland to Make Six Its Big-Production *Model*

Series to sell at from $695 to $850. Whippet Four continued without change, while minor improvements have been made in the Willys-Knight Great Six and 70 B.

THE big-production model of Willys-Overland, Inc., for 1930 is to be the Willys Six, a car with a 193 cu. in. engine (3¼-in. bore by 3⅞-in. stroke) which develops 65 hp. at 3200 r.p.m. The car is said to have a top speed of 72 m.p.h. and a maximum speed in second gear of 48 m.p.h. Such performance is outstanding for a vehicle selling at the following prices:

2-Pass. Roadster	$695	Touring	$735
Coupe	695	Coach	735
Rumble-Seat Roadster	725	4-Door Standard Sedan	795
4-Pass. Coupe	725	De Luxe Sedan	850

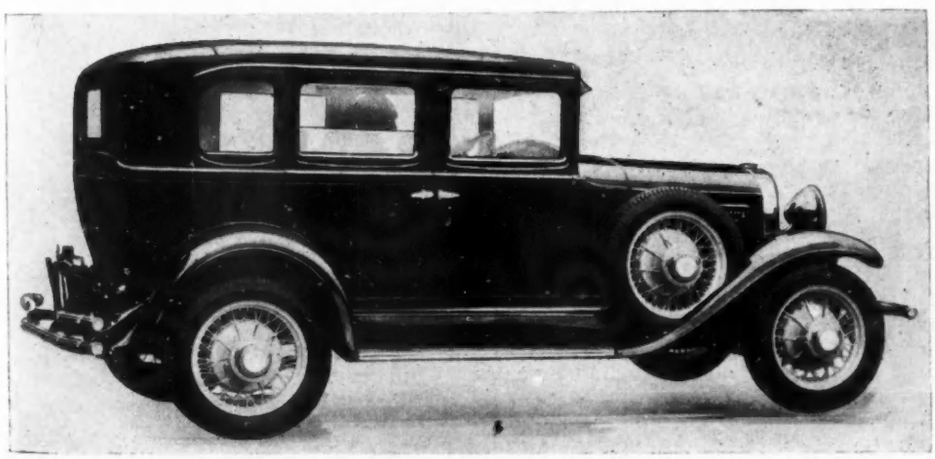
The Whippet Four is continued without change, while improvements have been made in the Willys-Knight Great Six and the 70 B, but the efforts of the Willys engineering department have been concentrated chiefly on the Willys Six. This car has a wheelbase of 110 in., 5.00/19 tires, Bendix two-shoe internal brakes all around, two-way hydraulic shock absorbers, full-pressure engine lubrication, rubber-insulated engine supports and other up-to-date features.

The crankshaft is of the four-bearing type, and because of the large diameter of its bearings in relation to the crank-throw is quite rigid. Counterweights are forged integral with crank arms. From the sectioned view of the engine it may be seen that the main bearings are substantially larger in diameter than the crankpin bearings.

Connecting rod big-end bearings are offset to reduce engine length, and two designs of rods are produced, one right and the other left hand. The offset might have been obtained by varying the thickness of the babbitt at the ends of the bearing, but Chief Engineer A. J. Baker of Willys-Overland says that does not give the desired result, as the effective width of such a bearing is no greater than that of its steel support. Pistons are internally ribbed, and there is ribbing also in the water jacket directly over the offset part of the combustion chamber, which serves both to strengthen the wall and to aid in the heat flow. A compression ratio of 5.6 is used. The valves are inclined to the cylinder axis, which permits of the use of ample bearing areas for both the stems and the pushrods without increasing the height and weight of the engine. Valve stems are ⅜ in. in diameter. The camshaft drive is by chain, the chain used being ¼ in. wider than it was in the Whippet Six. This drive is of the two-point type, the generator now being driven by the fan belt. Belt adjustment is effected by means of the generator mounting. The camshaft is supported in four bearings, of which the forward one (which takes the chain load) is bushed with a babbitt-lined, steel-backed shell, while the other camshaft journals bear directly in the reamed bores of the crankcase. Tappet brackets are fixed in the case and have removable liners. Before assembly of the valve stem guides the tappet bores are line-reamed together with the stem guide holes to a tolerance of 0.001 in. The tappets have chilled cast-iron heads and steel bodies, and the valve spring retainer locks are of the split-cone type.

The oil pump and ignition distributor are driven from the camshaft through an inclined shaft, the distributor being of the semi-automatic type. Although the oil pump is outside the crankcase (and therefore readily accessible), it is self-priming, and there is only one oil pipe in the lubrication system, which leads to the suction bell and strainer assembly. Drill holes in the connecting rod heads aid in the lubrication of the cylinder walls and piston pin bearings.

Other points of interest in the engine are a crankcase ventilating system with outlet below the engine pan, a Tillotson carburetor with a special starting by-pass operated from the choke, metric spark plugs and a ball bearing fan and water pump unit. Large-size (7/16 in.) connecting rod bolts are



The Willys Six de luxe sedan has wire wheels and folding trunk rack

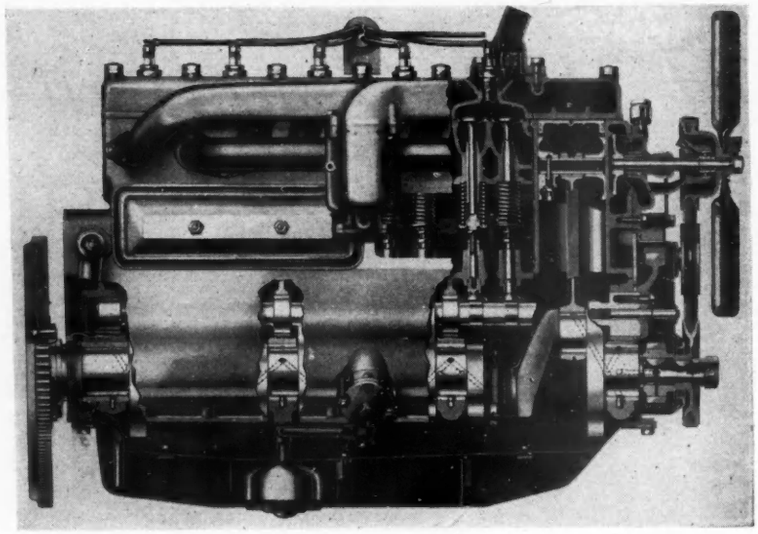
used, and the piston pins are locked in the pistons.

Rubber engine mounts are now used at four points. At the front they take the form of washers between vertical bolt bosses on a sheet metal plate and the frame brackets. At the rear the rubber is vulcanized to two sheet metal plates which attach to the frame side channel and a bracket bolted to mounting brackets cast integral with the bell housing respectively. The arrangement is such that the rubber is in tension vertically.

Brakes are completely new, however, both front and rear being internal, and of the two-shoe Bendix variety, with 11-in. drums. All four brakes are applied also by the "emergency" lever. With this design a single cross-shaft is used, having an intermediate bearing supported by a bracket from the center cross-member of the frame.

Aside from the Monroe double-acting shock absorbers and finger-tip control on the steering wheel, the standard equipment includes a dash heat control and a gasoline gage, a coil-type of ignition lock, a three-way instrument board light switch which also operates the dome light, adjustable seats in the sedans and parking lights below the headlights. Fuel feed is by the vacuum system.

The Willys-Knight Great Six or the 66-B is continued, but its engine now develops considerably more power, viz., 87 hp. at 3200 r.p.m., and a maximum torque of 191 lb.-ft. at 1000 r.p.m. No change has been made in the cylinder dimensions, the increased output being due to refinements in the design of the manifolding, combustion chamber and piston. The cooling facilities of the piston were improved to permit of the use of a higher compression ratio without danger of detonation, and the maximum b.m.e.p. is now 113 lb. p. sq. in.



Longitudinal section of the Willys Six engine, showing part of the four-bearing crankshaft, manifolding, external oil pump, ribbing in the water spaces over the combustion chamber, flat flywheel and unusually large valve stems

Marmon Lengthens Eights

GREATER power and added length characterize the Marmon Eight 69 and Eight 79, which replace the previous 68 and 78 series in the $1,500 and $2,000 price ranges respectively. The 69 is about 5½ in. and the 79 about 10 in. longer than its predecessor.

A new engine is used in the Eight 79, and all Marmon cars now are equipped with L-head engines, which is a direct reversal of older Marmon practice.

Among the chassis changes are the change-over to cable-operated Bendix two-shoe brakes, parking lamps on fenders, adjustable pedals on the 79, and adjustable steering columns and front seats on both lines. Brake drums on the Eight 79 are 14 in. in diameter and linings 2 in. wide. The braking effort is equally divided between front and rear.

Five body models in each series are to be manufactured initially, the five-passenger, four-door sedan, four-door-brougham, four-door club sedan, convertible coupe and standard coupe. A wide choice in colors is offered. On the Eight 79, laminated shatter-proof plate glass is used in the windshield and heavy plate glass elsewhere.

Rear axles use spiral bevel instead of hypoid differentials as in the former models. The propeller shaft is of 2-in. seamless steel tubing. Tapered roller bearings are used at the wheels. The rear axle ratio is 4.7 on all five-passenger models, 4.45 on others. The new Ross cam and lever steering system is used.

Auburn Offers Wide Range

THE Cord front-drive car, two straight eights and a six, all with a great array of features, many of which are exclusive, is Auburn's offering for 1930.

Three models are offered in the 6-85 six-cylinder line, the sport sedan, at $995; regular four-door sedan, at $1,095, and cabriolet at $1,095.

Four models are also offered in the 100 hp. straight eight line known as the 8-95. With their prices they are: Four-door sport sedan, $1,195; full sedan, $1,295; cabriolet, $1,295; phaeton, $1,395.

In the big straight-eight line, known as the 125, four models are available. They are: Four-door sport sedan, $1,495; four-door full sedan, $1,595; cabriolet, $1,595, and phaeton sedan, $1,695.

All three lines are equipped with Lycoming engines, Bijur chassis lubrication systems; hydraulic shock absorbers; internal four-wheel hydraulic brakes; cam and lever type steering; steel running boards; Brewster non-glare windshields on closed models and reinforced bodies.

The four models of the Cord front-drive automobile, Auburn's newest product, are attracting an unusual amount of attention at the New York Show. This is the first time that a front-drive automobile has ever been shown at a National Automobile show.

Continental to Show Five Models

CONTINENTAL MOTORS CORP., now entering upon its twenty-ninth year as gasoline engine builders, is exhibiting five models at the current New York National Automobile Show. The newest product, known to the trade as Model 20Z, is the largest engine ever built by Continental in either of its plants at Detroit and Muskegon, Mich. This is a six-cylinder motor, 5¼-in. bore and 6-in. stroke, and develops 150 hp. It is of the overhead valve type with removable cylinder sleeves. This model is designed for gas-electric bus service, mechanical drive, heavy-duty trucks and is adequate for motorizing small railway cars. Also it has been successful as a marine engine.

Just Among Ourselves

"Lest We Forget 1929" —a Wall Motto

BACK in 1921 the passenger car industry learned the lesson of small inventories and rapid turnover. It learned that lesson well; it has never forgotten it.

Has it learned in 1929 the lesson of production *actually* tuned to demand?

It would seem as though it had. Looking the whole situation over today, it doesn't seem as though output could be allowed to run away with dealer profits again. Leading manufacturing executives have stated their views clearly on this topic; they are reiterating those views. But there are some skeptics. Roy Faulkner, Auburn's vice-president, writes in a house organ statement: "Let's see this production control when May rolls around."

Maybe some wall mottos are being printed for offices of factory executives—to hang there throughout the period of increasing demand which unquestionably is coming within a few months — which will read: "Overproduction—Lest we forget 1929."

That's about all that remains to be said about overproduction, however, as we see it. Everybody is agreed about its bad effects. All that's necessary is to remember not to do it. Personally, we think the memory of the industry will be good.

* * *

Factory-Dealer Relationship Needs Constructive Work

AND talking about subjects on which little remains to be said, there is our old friend, factory-dealer relationships. Here is a case where action certainly will be more potent than words in 1930. The whole situation has been thoroughly aired. The pros and cons have been argued calmly, heatedly and in every other way.

We're somewhat inclined to agree with the statement made by the vice-president in charge of sales of one of our largest passenger car companies the other day when he wrote to us as follows:

"I believe the time has come when it would be a wise course to call a halt to further agitation on the subject of factory-dealer relationships. In making this statement I do not wish to be considered as condoning the ruthlessness and injustice which in some cases have marked the factory attitude toward dealers. Up to now there has been a sound reason for airing the whole subject.

"By this time, however, every factory that can in any way be influenced by such agitation has already instituted reforms, if reforms were necessary, and in my opinion further agitation can only tend to delay the placing of factories and dealers on a more cooperative basis than has prevailed in the past.

"Stated in another way, it is my thought that it is time to stop tearing down and start building up. . . . . It is high time that talk ceased and that factories and dealers jointly and cooperatively got back to the merchandising of motor cars."

* * *

Sound Marketing Effort Through Winning Workers

WHILE agitation of this factory-dealer relationship subject probably never will cease entirely until such time as the evils involved have been almost completely wiped out, it does seem as though we might all get to arguing around in circles sufficiently to detract from the mutually necessary business of merchandising in 1930. The industry is faced with the need for more active and more sound marketing effort in the next six months than at any previous time in its history. Reforms have been started. They won't be completed in six months. In the meantime there's a job to be done. Workers will win in 1930.

* * *

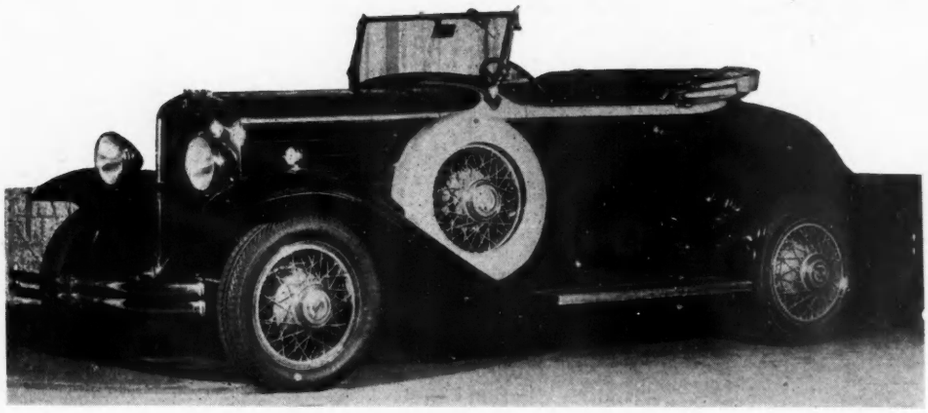
The Cartel Movement Has Not Weakened

IT has been quite evident recently that efforts have not ceased toward combining European automobile manufacturers in some sort of cartel directed strongly toward meeting American competition in Europe. Confidential meetings bearing on this subject have been held recently and there are plenty of minor evidences that European automobile factory executives have not given up hope of some such banding together.

A group of automotive executives is scheduled to meet at Prague around the middle of January, when further efforts to form a cartel are reported to be quite probable.

A year ago, American executives close to the situation regarded the possibility of such an association of European interests as very unlikely. Today the chances of any actual cartel may not be a whole lot better; but the idea of banding together to resist what is referred to as the "American invasion" certainly has not weakened in the last 12 months. Congressional activity in connection with proposed American tariff schedules hasn't helped the situation any.

It is worth remembering, in any case, that our major export markets lie outside of Europe itself and that the real competition for overseas business lies outside of those countries which already have a sizable automobile industry of their own.—N.G.S.



The de luxe roadster on the Durant 614 chassis gives an idea of the attractiveness of the 1930 Durant line

Durant Will Build Two *Chassis* Models *Instead* of Five

WHEN a new organization headed by A. I. Philp and Frederick J. Haynes took charge of Durant Motors, almost a year ago, it was generally felt that important revisions would be made before long in both policies and products. Both changes are represented in the 1930 line of Durant cars.

Instead of the five chassis models which were offered by Durant Motors in the past, only two will be built in 1930. Both are sixes, the 614 selling in competition with the lowest-priced cars in the six-cylinder field, while the 617 ranges in the $1,000 class. Both have new body lines and new mechanical features.

The leader of the Durant line, the 614, has a Continental engine developing around 60 hp. Features of the engine are a medium compression ratio, an exceptionally rigid crankshaft, and oil distribution without the use of piping. The transmissions of the new models are of the three-speed type. The rear axles are of new design, of the built-up type, with a very stiff malleable differential carrier and double tapered roller bearings at each rear wheel.

Steering gears have tie rods that cannot drop off. Brakes are Midland Steeldraulics of the latest type and with reinforced drums. Springs are of silico-manganese steel with Tryon shackles.

Frames have several new features. There is a crossmember immediately ahead of the rear engine mounts. At the front end, the side rail lower flange has been widened considerably and turned down to serve for the attachment of the lower gussets of the front crossmember.

Slightly sloping windshields of the VV type are fitted on closed models and forward-folding windshieds with cowl ventilators on the roadster and touring car. Doors overlap scuff plates at the bottom and are provided with windlaces at the sides to shut out drafts. The dash is insulated, and there is a rubber mat in the front compartment.

Headlamp tie rods are curved. De luxe models have fender parking lights, whereas standard models have parking bulbs in the headlights. Rear ends are dressed up with a metal valance over the tank and spring horns. Rear traffic signals are mounted on the left fenders.

The steering wheel is of the new three-spoke type and the only control on it is the horn button. Button controls for the light switch spark, throttle and choke are carried on the instrument board. Depressible beams are operated by a foot dimmer switch.

Reverting to mechanical details, exhaust valves are of silicon-chromium steel; the distributor arms form the clamps for the distributor heads, permitting rapid adjustment of the spark timing; front end chain drives are of the short, two-point type, the generator being driven off the water pump, which in turn is driven by the fan belt.

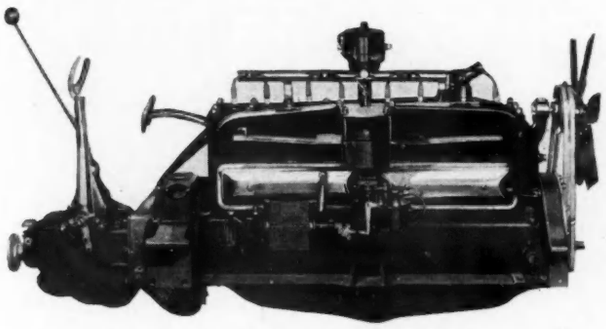
Pistons are of Bohnalite type and have two compression rings (grooved to form an oil seal), in addition to the oil regulator and oil scraper rings. The fan is oil-lubricated. Spark plugs are metric. A thermostat is fitted in the cylinder head and an AC fuel pump and an air cleaner are fitted.

Companion-flange type universals are now used at the front as well as at the rear. Spring seats and brake backing-plate carriers are welded to the 3-in. axle tubes; bearings are Timken throughout, with double Timkens, shim-adjusted, at the wheel ends.

The new type Steeldraulic brakes have a T-section shoe half on the self-energizing side, in place of the former channel section. Drums are not machined, as it has been found, it is claimed, that leaving them with the die-finish reduces scoring. Emergency brakes operate on all four wheels.

Timken bearings support the worm shaft of the worm-and-sector steering gear, which has a reduction ratio of 14½ to 1. Pitman shafts are 1⅛ in. in diameter. Tie rods have the male part of the ball joints assembled from the bottom, so that if the retaining plugs should drop out, the tie rod will not drop off. There is about ½ in. more spread between front wheel bearings than in the former Durants.

Mechanical changes are less numerous on the 617. The four-speed transmission with which this model is equipped has been redesigned to give standard shift. The emergency low is now latched out, and the reverse is in its normal position. The design is based on the Durant 70, but it has a new frame, and the bodies also are new. Engine mounts are no longer of the shim type, but have the rubber vulcanized to metal plates.



Pierce-Arrow straight-eight engine for Group A models

Pierce-Arrow Price Range Broadens

Values trend downward. Engine and chassis refinements make 1930 cars unusual

THREE lines of eight-cylinder cars in four wheelbases constitute the offering of the Pierce-Arrow Motor Car Company for 1930, as compared with two lines of eights during the past year. The net effect is to widen the price range of the Pierce-Arrow line, chiefly in the downward direction.

As the result of mechanical refinements both in the powerplant and in the chassis, including the adoption of a new transmission, performance of the 1930 Pierce-Arrows is something quite remarkable.

Engine sizes now vary with the wheelbase as follows:

	Group A	Group B	Group C
Horsepower	132	...	115
Displacement	385 cu. in.	366 cu. in.	340 cu. in.
Wheelbase	144 in.	139 & 134 in.	132 in.
Bore	3½ in.	3½ in.	3⅜ in.
Stroke	5 in.	4¾ in.	4¾ in.
Price range	$3,975-$6,250	$2,975-$3,750	$2,595-$2,750

Fundamentally the engines remain the same as last year, although improvements have been made.

Changes on all engines include the adoption of a two-point chain drive for the fan-shaft, belt drive for the generator, a larger generator, drive of the water pump from the generator shaft through flexible couplings, an increased size of water pump inlet, larger oil pump, and belt-adjustment range increased from 1 to 1¾ in. by combining an eccentric fanshaft mounting with a double set of holes in the fanshaft bracket mounting plate.

All carburetors now have a larger air intake and are fitted with United air cleaners. A change has been made in the crankcase ventilating system, the outlet from the crankcase now being connected to the carburetor inlet and the connection made by flexible tube. Since this outlet is from the valve chamber, multiple screens have been provided within the latter to separate oil from the air being drawn out. In the lubricating system there is now a direct pressure lead to the timing chain compartment. Higher air domes are found on the fuel pumps on all three engines. Manifolds are of the Swan type. Wherever possible, engine bolts and nuts are of stainless steel, both for appearance and to prevent rusting.

On the two larger engines double Vee belts are used to drive the fan and generator; new 19-in. six-blade roller bearing aluminum fans are mounted, Handy oil filters are fitted, the pistons are equipped with two compression, one oil scraper and one oil regulator ring; dual manifolds, double-breaker distributors and two ignition coils are provided. The Group C engine also has a double-breaker distributor, but only a single coil.

Changes in the chassis are substantially the same on all cars. Standard transmission ratios are 1.25 in third, 2.08 in second, and 3.12 in emergency low. The reverse reduction is 2.73.

The propeller-shaft brake has been eliminated, and both emergency and service brakes now operate on all four wheels, Bendix three-shoe brakes being used.

Further chassis features retained include the Marles-type steering gear, Fafnir ball bearing shackles, Houdaille shock absorbers, and fender-type headlights. The latter now have convex lenses, however, while the bracket-type parking lights are larger.

A new radiator with more efficient cooling characteristics has been adopted. It has a 2¾-in. core depth and larger (2 in.) lower outlet. Water capacity is 6½ gal.

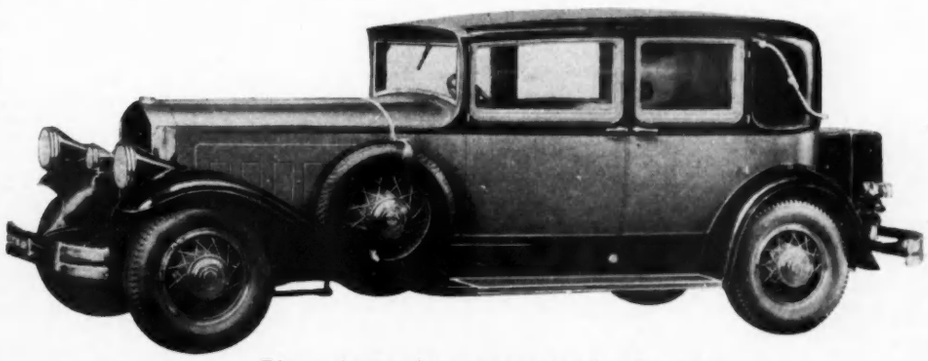
Door-type hood ventilators are used instead of louvers on the 134, 139 and 144-in. wheelbase models. The largest of these also has a new type of all-steel running board, with molded rubber mat and chrome-plated brass and stainless steel inserts.

Hudson Enters Eight Field and Essex Power is Increased

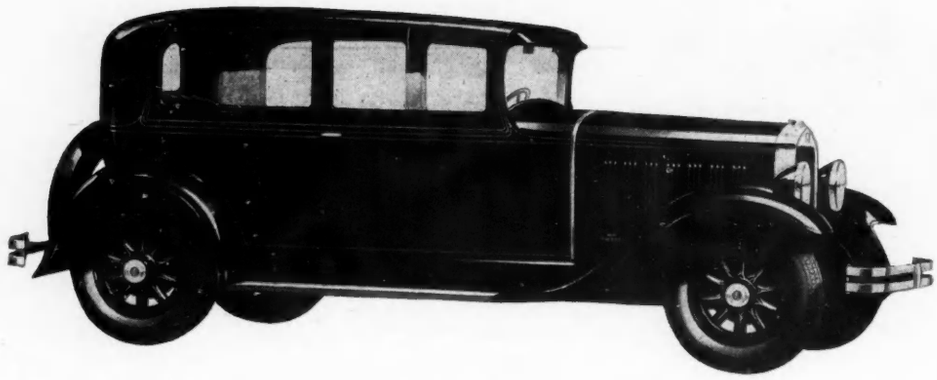
(*Continued from page 13*)

turned toward the rear, and the air stream from the fan in blowing by them creates a suction which draws fumes from the crankcase. The engine is supported at four points on rubber shims.

With a compression ratio of 5.78 to 1, this engine of only 214 cu. in. piston displacement is claimed to develop 80 hp. at 3600 r.p.m. The b.m.e.p. exceeds 100 lb. per sq. in. between 800 and 2600 r.p.m.



Pierce-Arrow five-passenger sedan for 1930

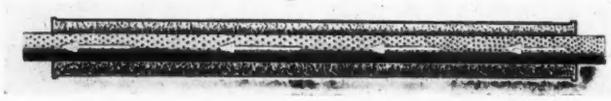


The Dynamic Erskine five-passenger club sedan

Erskine Resembles Dictator

"Dynamic" series develops 70 hp. at 3200 r.p.m., using larger valves and higher compression ratio. Design has been improved.

THE new Erskine model, referred to as the Dynamic Erskine, is quite different from the car which has borne the Erskine name heretofore and bears considerable resemblance to the Dictator six introduced last June. Its wheelbase (114 in.) is 1 in. less than that of the Dictator model, and its cylinder bore (3¼ in.) is ⅛ in. less. By the use of a double-drop frame it has been possible to lower the body and make it more graceful. Front and rear body curves in the new series follow very closely those of the previous Dictator six. Trilateral belt moldings in contrasting colors are used to good effect, especially in the rear quarter section.



The Dynamic Erskine is equipped with Burgess acoustic type mufflers, which have walls lined with steel wool

Radiators are long and narrower and are carried to a peak at the filler cap to present a characteristic appearance when viewed from the front. The nameplate also has been changed to a coat-of-arms effect, while the letter "E" in a new script form is now carried on each hub plate.

Mechanically the most important differences lie in the engine, engine mounting, braking system, dash starter control, single-turn caps for the radiator and gasoline tank, the Burgess acoustic muffler and adjustable front seats.

The engine has a bore and stroke of 3¼ by 4⅛ in., and although the bore is ⅛ in. smaller than in the previous Dictator, the horsepower has been increased from 65 to 70, the latter output being obtained at 3200 r.p.m. This gain is due to the use of larger valves, a higher compression rato and an important decrease in the exhaust back pressure due to the use of the new acoustic muffler.

The compression ratio has been increased slightly. Main bearings now are 2⅛ in. in diameter and of the following lengths (front to rear): 2 31/32, 1 9/16, 1⅝, and 2 13/16 in.

As will be seen from the illustration, the new muffler consists of a straight tube with perforated wall, passing through a pressed steel pipe, the space in between being filled with steel wool. This design has the advantage that it provides a straight passage for the burned gas through the muffler, whereas in the old design of muffler the gases were forced to turn back upon themselves and the gas within the muffler was used as a cushion to deaden the detonation. The engine now is mounted on rubber, and a Lanchester vibration damper is fitted.

All accessories, including the fan, water pump, oil pump, distributor and generator, now are driven through the same shaft off the front end silent chain. An oil filtrator is provided in the new Erskine.

Brakes in the new cars are the new two-shoe Bendix type actuated by cable. Brake drums are 12 in. in diameter and 1½ in. wide. giving a total braking area of 226 sq. in. The emergency brake operates on all four wheels. The single plate dry-disk clutch has been improved by the introduction of a torsional damper.

A Ross cam-and-lever steering gear of the new roller-bearing type, having a ratio of 15 to 1, is standard equipment. Knuckle pins in the new jobs are fitted with roller bearings.

Among interior refinements are wider seats, arm rests in the rear of sedans and the landau, silk shades at back and rear quarter windows, dome light, heavier tonneau carpet and polished robe and foot rails. Storm curtains on the tourer are of the English type and may be left in an upright position with the top lowered.

The steering column is adjustable and pedals are fitted with heavy rubber pads. Windshields are full ventilating and adjustable over a 9 in. range. A cowl ventilator is provided in all models.

Oldsmobile F-30 Design Has Many Refinements

THE Oldsmobile Six, now referred to by the manufacturers as the F-30, will remain basically the same for 1930, although numerous refinements have been made in its design. Prices have been slightly increased ($20 in the cases of the two-door and four-door sedans), new prices for the complete line being given in the table herewith. The general appearance of the car has been somewhat changed by the elimination of the saddle-type panel on top of the cowl and the adoption of a full-length belt molding.

Both sedans, two-door and four-door, are roomier. Cushion and seat-back springs have been improved. Windshields now slope slightly (7 deg.). Instrument panels are new, the panel itself being of etched steel. Considerable effort has been spent on the closed bodies to make them more rigid and free from squeaks and rattles. Body braces are strengthened throughout. The slatted roof is entirely supported by metal brackets from the body top rails. Rubber shims are used between body and frame, and convex lock washers serve to maintain the tension on the body bolts, which latter have been increased in number.

Oldsmobile Six, Model F-30

	Standard Equipm't	Special Equipm't	De Luxe Equipm't	Five Wire-Wheel Equipm't
Two-Door Sedan	$895	$970	$1,025	$950
Four-Door Sedan	995	1,070	1,125	1,050
Patrician Sedan	1,060	1,135	1,190	1,115
Business Coupe	895	970	1,025	950
Sport Coupe	965	1,040	1,095	1,020
Convertible Roadster	995	1,070	1,125	1,050
Phaeton	965	1,040	1,095	1,020

Improvements are found in practically every chassis unit. Refinements in the form of the combustion chamber are said to have increased the engine power by about 3½ per cent. The spark plug is nearer the center of area as well as of volume, and the dome is slightly higher.

A Johnson carburetor is now fitted, which is provided with an accelerating pump and well, interconnected with the throttle, and a cold-weather-starting by-pass operative with the last ¼ in. of choke-control travel. This by-pass carries fuel directly from the float chamber into the inlet manifold riser.

Softer clutch-pedal action has been obtained by the elimination of three of the former nine springs. Rear axles now have a one-piece housing, swaged or upset from a piece of seamless tubing split in the middle to form the banjo. The wall thickness is increased about 1/32 in.

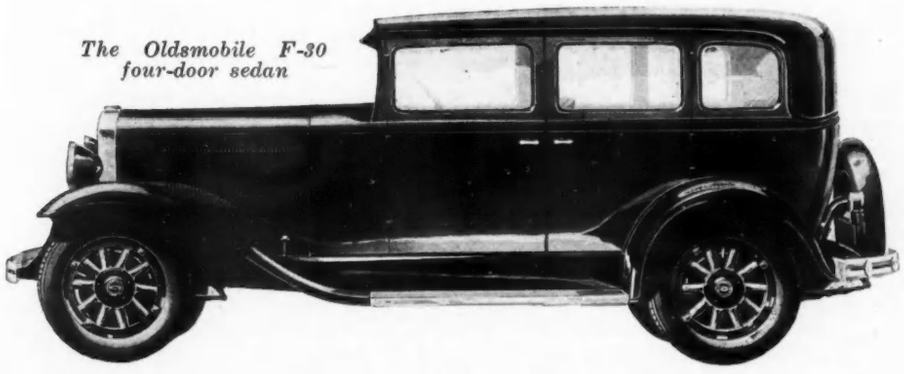
The rear axle gear reduction has been increased slightly, to 4.54 to 1. Rear springs were changed recently from chrome-vanadium to silico-manganese steel. The Tryon shackles are now fitted with felt oil-retaining washers, for oil lubrication.

Both front and rear brakes are now of the two-shoe Bendix type, cable-operated. Molded lining is used, because its rather high friction coefficient permits of easier brake operation. The lining on the self-energizing shoe is cut away at the toe to prevent "shoe-distortion squeal."

Another new unit is the steering gear, which is manufactured by Saginaw Products Division, General Motors Corp. It is best described as an hour-glass worm and three-tooth sector type, with a taper-roller-bearing mounting for the worm. Both worm and sector are of steel, the worm being copper-plated. In machining the worm, the ends are relieved, so that when slack develops in the center position and it becomes necessary to take it up, there will be no tendency to bind in the "hard over" positions. Adjustment is by means of an eccentric sleeve on the sector shaft.

With this new steering gear goes a new steering wheel with finger grips in the lower surface only, the upper surface being smooth. Headlamps are of the Guide Tilt-Ray type, using 9¾ in. lenses.

On the two-door sedan, the length of the body has been increased 1¾ in. and both this model and the four-door sedan have been increased in the effective seat widths, front and rear, being 1½ in. greater.



The Oldsmobile F-30 four-door sedan

Viking Prices Increased

NO major changes are being made at show-time on the Viking. An option of five wire wheels at $75 extra, however, is being made available. Prices as of January 1st are increased $100 on all models, making the list price of all models with standard equipment $1,695.

Body Type	Std. Equipm't	Spec. Equipm't	De Luxe Equipm't	Five Wire-Wheel Equipm't
4-dr. Sedan	$1,695	$1,795	$1,855	$1,770
Brougham	1,695	1,795	1,855	1,770
Convertible Coupe	1,695	1,795	1,855	1,770

First with the News

Reliable, Accurate

News of the Industry

PAGE 28 VOLUME 62 *Philadelphia, Saturday, January 4, 1929* NUMBER 1

Ford to Have Plant at Richmond, Cal.

Capacity of 400 Cars Per Day Planned For New Operation

DETROIT, Jan. 2—The Ford Motor Co. will begin construction of its new assembly plant at Richmond, Cal., early in the spring, Edsel B. Ford, president of the Ford Motor Co., announced here yesterday. The new plant will have a capacity of 400 cars a day, and it is expected that construction work will be completed within the present year. A slip along the property has been dredged to a depth of 32 ft. and connects with a deep-water channel to the sea.

The new plant replaces the one now located in San Francisco, and will have an increased production capacity over the older one. The property is serviced by two railroads, and its location on the Richmond Harbor channel permits ships of 30 ft. draft to dock at low tide. Ships will be able to discharge directly into the warehouse of the new plant, which will have a storage capacity of materials and parts for more than 5000 cars.

Packard Deliveries Gain

DETROIT, Dec. 31—Retail deliveries of the Packard Motor Car Co. during the second 10 days of December exceeded those of the corresponding period last year by a comfortable margin, according to H. W. Peters, vice-president in charge of distribution. Used car stocks of Packard distributors and dealers on Jan. 1 will be under what they were a year ago and good buying is under way, according to the statement by Mr. Peters.

Van Sicklen to Buy Lorraine

NEW YORK, Dec. 31—The Van Sicklen Corp., subsidiary of the Allied Motor Industries, Inc., has authorized flotation of convertible six per cent notes in connection with the acquisition of the Lorraine Corp. Of this loan, $600,000 will be issued immediately, the proceeds providing for the cash requirements in connection with the acquisition of Lorraine, and other corporate purposes, according to an announcement made by the company.

Pierce-Arrow Head Resigned This Week

BUFFALO, Dec. 30—Myron E. Forbes, president of the Pierce-Arrow Motor Car Co. for the last seven years, has resigned, his resignation to be effective Dec. 31. His succesor will be named following the directors' meeting of the Studebaker Corp. in New York, Dec. 7, it has been announced.

Myron E. Forbes

Mr. Forbes went with Pierce-Arrow in 1919 as treasurer. Two years later he became vice-president and general manager, and in the following year, president. He was formerly with Deere & Co., and at one time was general manager of the Syracuse Plow Co.

During the war he headed an organization which produced drop forgings for the Government. During his incumbency at Pierce-Arrow he served also as president of the Pierce-Arrow Finance Co. He is a director of the Marine Trust Co., of Buffalo, and is a member of the Society of Automotive Engineers. Mr. Forbes has not disclosed plans for his future activity.

Dodge Dealers to Meet

DETROIT, Dec. 31—Approximately 1000 Dodge Bros. dealers and sales representatives from all parts of the country are expected to attend the two-day convention here Jan. 3 and 4, at which time C. W. Matheson, general sales manager, will announce plans for 1930 and new cars will be shown to the dealer organization. Mr. Matheson will call attention to the fact that the world-wide Dodge organization is this year observing the fifteenth anniversary of its foundation as a manufacturer of automobiles.

Kearney Plant Resuming

NEW YORK, Dec. 31—The Kearney plant of the Ford Motor Co. has been recalling workmen who were laid off during the recent shutdown and has rehired, since Dec. 15, 2500 men.

Durant to Center Output in Lansing

Wider Participation in Truck Field Announced For This Year

DETROIT, Jan. 2—A preshowing of new Durant models is being held for residents of Lansing, Mich., beginning yesterday and running for three days. In announcing the showing, R. A. Vail, vice-president of Durant Motors, Inc., said that, eventually, all activities of the company will be centered in that city, and that, in time, a new administration building would be erected and the general offices moved there from Detroit.

Mr. Vail said, also, that the company was planning to enter the truck industry on an increased scale, and that bodies would be manufactured at the North Lansing plant of Hayes Industries, Inc. The Motor Wheel Corp., Lansing, is making all wire and steel wheels purchased by the company, according to the announcement made by Mr. Vail.

De Soto Models Shown

DETROIT, Jan. 2—New models of the De Soto car were shown at a meeting of approximately 700 dealers from all sections of the country, held at the Masonic Temple here Monday. J. E. Fields, vice-president in charge of sales of the Chrysler Corp., and president of the De Soto Motor Corp., and L. G. Peed, general sales manager of the the De Soto Motor Corp., addressed the gathering.

Milwaukee Stamping Buys Plant

MILWAUKEE, Dec. 30—Acquisition of the Litterer Bros. Mfg. Co., 3022 N. Rockwell St., Chicago, by the Milwaukee Stamping Co., and consolidation of its plant with the Milwaukee works has just been announced. The Milwaukee Stamping Co. is a pioneer manufacturer of automobile and builders' hardware.

Denver Plant Resumes

DENVER, Dec. 30—The Denver Branch of the Ford Motor Co. recommenced operations Dec. 26 with about half its usual force, and is putting on men daily planning to be on normal production, and with its usual number of employees by January 10.

Nash Prices Raised On All 1930 Series

Increases up to $140 on Twin Ignition Eight Announced

KENOSHA, WIS., Dec. 30—New prices on Nash cars, embodying raises to $30 on the single six series, $50 on the twin-ignition six, and $140 on the twin-ignition eight, have been announced from the offices of the Nash Motors Corp. The new series of cars was described in *Automotive Industries* for Oct. 5, on page 471.

Following are the new Nash prices:

Single Six	New Price	Old Price
5-pass. 4-door sedan	$1,005	$985
4-pass. cabriolet	1,005	985
2-pass. coupe	940	915
4-pass. coupe, rumble seat	980	955
5-pass. 2-door sedan	935	915
5-pass. landaulet	1,155	1,125
4-pass. roadster	975	945
5-pass. 4-door de luxe sedan	1,095	1.075
5-pass. touring	995	975

Prices f.o.b. Racine.

Twin Ignition Six	New Price	Old Price
5-pass. 4-door sedan	$1,415	$1,385
4-pass. cabriolet	1,385	1,355
2-pass. coupe	1,345	1,295
4-pass. coupe, rumble seat	1,395	1,345
5-pass. 2-door sedan	1,325	1,295
7-pass. 4-door sedan	1,745	1,695
4-pass. roadster	1,365	....
7-pass. touring car	1,475	1,425
5-pass. tonneau cowl touring	1,595	1,545
4-pass. Victoria	1,410	1,385

Prices f.o.b. Milwaukee.

Twin Ignition Eight	New Price	Old Price
5-pass. 4-door sedan	$1,795	$1,695
4-pass. cabriolet	1,875	1,775
2-pass. coupe	1,915	1,775
4-pass. coupe, rumble seat	1,975	1,845
5-pass. 2-door sedan	1,675	1,625
7-pass. 4-door sedan	2,195	2,085
7-pass. limousine	2,385	2,260
5-pass. Ambassador	2,095	1,995
Burbank Ambassador	2,095	....
5-pass. Victoria	2,045	1,945

Prices f.o.b. Kenosha.

Grand Rapids on 24-Hour Schedule

DETROIT, Jan. 2—The Grand Rapids Metalcraft Corp., maker of interior trim, decorative moldings and refinements for closed cars, is operating on a 24-hour-a-day schedule to handle large orders from three major automobile companies.

Curtiss Entry Wins Safe Plane Contest

NEW YORK, Jan. 1—The "Tanager," entry of the Curtiss Aeroplane and Motor Co., in the International Safe Aircraft Competition sponsored by the Daniel Guggenheim Fund for the Promotion of Aeronautics, has been awarded the grand prize of $100,000, according to an announcement by Captain Emory S. Land, vice-president of the fund. The Curtiss entry was the only plane to complete all the qualifying tests. The Handley-Page entry, runner-up to the "Tanager," failed to qualify for the minimum gliding speed requirement.

Stutz Merger Predicted as Creditors File Suit

INDIANAPOLIS, Dec. 31—A merger of the Stutz Motor Car Co. of America with some other manufacturer of automobiles was forecast yesterday by M. E. Hamilton, treasurer of the company, following the filing in Federal Court of a petition of involuntary bankruptcy against the company, and the presentation in state courts of two suits asking the appointment of a receiver.

The bankruptcy petition was filed by three Indianapolis creditors who listed aggregate claims of $2,175. The receivership suits were filed in state courts by the Standard Automotive Equipment Co., Muskegon, Mich., which lists a claim of $753, and the Faires Mfg. Co., of Decatur, Ill., listing an account of $1,399. In these suits it was alleged that the Stutz company was in imminent danger of insolvency.

The company has 20 days in which to file an answer to the petition in bankruptcy. E. S. Gorrell, president of the Stutz company, has been away from Indianapolis for several days, and could not be reached in time to get a statement.

S. M. Neville

CLEVELAND, Dec. 31—S. M. Neville, president of the Leece-Neville Co., Cleveland, passed away unexpectedly while playing golf at Fernandina, Fla. Mr. Neville was a pioneer in the manufacture of electric starting and lighting equipment and president of Leece-Neville since 1909. He was 68 years old.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries.

NEW YORK, Jan. 2—Recent storms which have swept over the whole country have retarded business in some lines, while the volume of trade in others has shown no decline. Christmas buying is reported to be equal to that a year ago, with the exception of trade in high-priced goods.

LIFE INSURANCE SALES

Sales of new ordinary life insurance during the year 1929 were 8 per cent above those during the preceding year, while life insurance business in 1929 is estimated to have been about 90 per cent above that in 1921.

CONSTRUCTION CONTRACTS

Construction contracts awarded in 37 Eastern States during November amounted to $391,012,500, according to F. W. Dodge Co., as compared with $471,482,200 a year ago, while contracts awarded during the first 11 months of the year amounted to $5,437,922,400, as against $6,195,529,800 during the corresponding period last year.

CRUDE OIL PRODUCTION

Average daily crude oil production in the United States during the week ended Dec. 21, amounted to 2,633,800 bbl., as compared with 2,622,250 bbl. for the preceding week and 2,550,750 bbl. a year ago.

FREIGHT CAR LOADINGS

Railway freight loadings for the week ended Dec. 14 totaled 923,240 cars, which marks a decrease of 40,428 cars below those a year ago, but an increase of 54,490 cars above those two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 28 stood at 93.1, as against 92.8 the week before and 92.6 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Dec. 24 were 5 per cent below those in the corresponding week last year.

BROKERS' LOANS

Brokers' loans in New York City for the week ended Dec. 24 declined $58,000,000, reducing the total to $3,328,000,000, as against $5,091,000,000 a year ago.

FEDERAL RESERVE STATEMENT

The consolidated statment of the Federal Reserve banks for the week ended Dec. 24 showed increases of $25,700,000 in holdings of discounted bills and of $45,500,000 in holdings of bills bought in the open market, while there were decreases of $48,200,000 in holdings of Government securies and of $88,100,000 in member bank reserve deposits.

Financial Notes

Company	Remarks
Continental Motors Corp.	earning fiscal year end. Oct. 31 $733,495 bef. Fed. taxes, equal to 33½c per share.
De Haviland Aircraft Co.	Init. div. 10% old Am. dep. receipts, 6 2/3% new Am. dep. receipts.
Fokker Aircraft Corp.	reg. quar. div. 43¾c on pref. stock
Hayes Body Corp.	rescinded 2% div. voted and announced recently by directors.
Indian Motocycle Co.	reports net loss of $405,957 for nine mos. ended Sept. 30.
Lansing Stamping Co.	reg. quar. cash div. 2½%.
Spicer Mfg. Co.	reg. quar. div. 75c on com. and 75c on pref.

Men of the Industry and What They Are Doing

Warner Appoints Brown

W. C. Brown, formerly president of the Sparton Aviation Company of Tulsa, Okla., and later U. S. representative of the Walters engine which is made in Czecho-Slovakia, has been appointed vice-president in charge of sales of the Warner Aircraft Corp. Mr. Brown received his aviation training as a pilot in the U. S. Army during the war.

Hudson Changes Positions

Ray M. Hudson, assistant director of the National Bureau of Standards, has presented his resignation, to take effect Dec. 31, according to an announcement from the bureau. On Jan. 2, Mr. Hudson assumed office as secretary of the Massachusetts Division of the New England Council. Among Mr. Hudson's former connections was a period with the H. H. Franklin Mfg. Co., Syracuse.

Damon is Promoted

Ralph Damon, production manager for the Curtiss-Robertson Airplane Mfg. Co. since the building of Robin planes was started at Lambert-St. Louis Field 18 months ago, has been appointed assistant to J. A. B. Smith, executive vice-president of the Curtiss-Wright Corp. Mr. Damon will take up his new duties at New York next month.

Stewart Succeeds Armstrong

W. F. Armstrong, production manager of the Olds Motor Works, Lansing, Mich., has been succeeded by L. A. Stewart, formerly assistant production manager. Mr. Armstrong, who declined a post offered him by General Motors in the Opel organization, is to be transferred to another division in the corporation, it is explained.

Sharp and Thomas Moved

David D. Sharp and A. W. Thomas, of the Ford Motor Co. of Can., Ltd., left Windsor, Ont., Dec. 19, for Singapore, S. S., where they will assume their duties as district sales managers of the Ford Motor Co. of Malaya. They will sail Jan. 7.

Federal Appoints Krohn

Henry Krohn, for 18 years sales manager of the former Paige-Detroit Motor Car Co., has been appointed sales manager of the Federal Motor Truck Co. Mr. Krohn is widely known in passenger car circles. This is his first entrance into the truck field.

Mack Transfers Hazell

R. T. Hazell has been appointed Montreal branch manager for Mack Trucks of Canada. Mr. Hazell has been connected with the Mack company for the past five years.

Bell is Made Manager

Frederick B. Rentschler, president of the Aeronautical Chamber of Commerce of America, Inc., has announced the appointment by the executive committee of Luther K. Bell as general manager of the Chamber. Mr. Bell has been acting general manager since S. S. Bradley resigned last July.

Watson Appoints Hildebrand

Kenneth W. Hildebrand has been appointed manager of the Detroit branch of the John Warren Watson, Philadelphia, manufacturer of Watson stabilators, according to an announcement made by the company.

Bauer and Lawrence Return

George F. Bauer, manager of the export department of the National Automobile Chamber of Commerce, returned on the Berengaria, Dec. 30. John V. Lawrence, European representative of the same organization, has just returned to this country for a two months' stay.

Massey Joins U. S. Rubber

A. H. Massey, general sales manager of the Combination Rubber Co., Trenton, N. J., has resigned to accept a position with the United States Rubber Co. Mr. Massey was formerly western representative for the Combination Co.

Foreign Visitors Attending New York Show

Courtesy of the National Automobile Chamber of Commerce

E. H. Hampton	Hampton, Watson & Cia.	Argentina
J. Ross Duggan	Ross Duggan Pty., Ltd.	Australia
R. S. Harden	Chrysler	Australia
T. R. M. Scott	Chrysler	Australia
Wm. Boeckl	Austrian Automobile Club	Austria
Jacques van Gorkum	American Equipment Co., Ltd.	Belgium
J. Seidelin	S/A Enterprises Com. au Congo Belge	Belgium
C. F. Gundlach	C. F. Gunlach & Cia.	Bolivia
O. A. Beach	Beach Motors, Ltd.	Canada
Geo. W. Boyd	Boyd's Garage	Canada
J. R. Dixon	Ottawa	Canada
L. V. Hadwin	Mills-Hadwin, Ltd.	Canada
G. E. Mills	Mills-Hadwin, Ltd.	Canada
J. D. Isaacs	Middlesex Motors, Ltd.	Canada
R. D. Kirby	Durant Motors of Canada	Canada
W. H. McIntyre	Ottawa Car Mfg. Co., Ltd.	Canada
T. R. Price	McLaughlin Motor Car Co., Ltd.	Canada
D. J. Wright	Western Canada Motor Car Co.	Canada
S. W. Hobart	Canadian Auto. Manufacturers & Exporters Association	Canada
W. G. McFarlane	Cadillac Motor Car Co.	Canada
R. J. Bailey	Cadillac Motor Car Co.	Canada
R. A. Tuck	Cadillac Motor Car Co.	Canada
Lorne Ardiel	Cadillac Motor Car Co.	Canada
Harris Ardiel	Windsor Motors Ltd.	Canada
A. P. Holton	Studebaker Representative	Cuba
Ing. E. Czyptschirsch	Zavody Tatra Works	Czechoslovakia
Ing. Fr. Bittmann	Zavody Tatra Works	Czechoslovakia
Ing. B. Mimra	Zavody Tatra Works	Czechoslovakia
Frank Suk	Association Des Marchands et Commercants Automobile a Prague	Czechoslovakia
C. Friis	Studebaker Representative	Denmark
Otto Bruun	Studebaker Representative	Denmark
Sir Herbert Austin	Society of Motor Manufacturers & Traders, Ltd.	England
E. C. Gordan England	Motor Agents Association	England
R. L. Barnum	Motor Agents Association	England
Harold Butcher	The Liverpool EACHO	England
Leonard Williams	Leonard Williams & Co., Ltd.	England
E. Bennett	Northwestern Motors, Ltd.	England
W. M. Bailey	Chrysler	England
G. A. Viriot	Auto Club de l'Ouest	France
Christian Lie	Chrysler Distributor	France
Frederick Blow	Franklin Dealer	France
Hans F. Komnik	Automobilefabrik Komnik A/G	Germany
Johannes Buschman		Germany
Egon Eisenhaner	Bremen Nachrichten	Germany
Bernhard Stern	Ullstein Publishing Co.	Germany
Max R. Kaufman	Hamburger Fremdenblatt	Germany
Anton Kneer	Kneer's Garage	Haiti
L. F. Mahlmeyer	Overland Dealer	Holland
A. van der Helden	Peerless Distributor	Holland
Mr. Ricardo	Indian Road & Transport Development Association, Ltd.	India
Comm. Avv. Faldella	National Fascist Motor Trade Association	Italy
Ing. T. Zerbi	FIAT Motor Car Co.	Italy
Ing. C. Fessia	FIAT Motor Car Co.	Italy
Cav. A. Prever	FIAT Motor Car Co.	Italy
Ing. Luigi Sossi	FIAT Motor Car Co.	Italy
Beveridge Brewster	Dodge & Seymour	Japan
R. A. de Schausten	Garage Americain	Martinique
A. P. Ward	Willys-Overland Representative	New Zealand
R. L. Henry	Nash Representative	New Zealand
A. E. Hickman	A. E. Hickman & Co., Ltd.	Newfoundland
B. M. Blackader	Nash Dealer	Nova Scotia
W. Y. Boyd	Boyd Bros., Ltd.	Panama
A. de la Torre Bueno	Asociacion de importadores de Automoviles del Peru	Peru
Mr. Dominguez	Dominguez & Boueri	Persia
Luis Tirado	Touring Club.	Peru
Joachim Gerson	M. Rozental & Ch. Tenenblum	Poland
Count of Torrubia	Franklin Dealer	Spain
L. W. Wallay	Studebaker Representative	Spain
Gunnar V. Philipson	Philipson's Automobile A/B	Sweden
Ernest Seilige	Caracas	Venezuela

Last Week of Year Shows Gain in Plant Projects

PHILADELPHIA, Jan. 2—Numerous contemplated automotive plant additions have been announced this week, making the showing for the last seven days of 1929 well ahead of the final week of 1928. Few large programs developed during the week, however.

Among the announcements of contemplated construction and projects under way were:

Aeronautical Retarding Gear Co., Inc., Richmond, Va., to invest $75,000 in plant for manufacturing mechanical devices and equipments for airplanes.

Kelsey Wheel Co., Detroit, planning additional expenditure of $450,000 for steel wheel plant. Albert Kahn, Inc., architects.

Hill Diesel Engine Co., Lansing, Mich., will increase capital from $125,000 to $1,000,000, part of new financing to be used for additional manufacturing facilities.

Accuralite Co., Muskegon, Mich. (pistons), considering $30,000 addition to plant.

Timken-Detroit Axle Co., Detroit, plans expenditure of $85,000 for new factory addition.

Indianapolis Municipal Airport to begin soon on construction of $100,000 hangar and shop program. Address City Hall, Indianapolis, Ind.

Metal-Air Corp., Oklahoma City, Okla., considering construction of $80,000 plant for manufacturing aircraft.

Marr & Holman, Nashville architects, will take bids this month on the Nashville Bus Terminal Station, two stories, Sixth and Commerce Sts. Cost about $150,000 and to be used on all bus lines entering Nashville. Frederick Smith, Smith Coach Co., Memphis, is secretary.

Marr & Holman, Nashville architects, will take bids in January on the Firestone Tire Co.'s new Nashville home.

A. O. Smith Corp., Milwaukee, plans new administration building and science laboratory costing about $500,000. The Milwaukee public land commission has granted the Smith company's request to waive requirements of a zoning law so that the building may be 125 ft. high, or eight stories. The legal limit was 85 ft. in this district.

Glancy Malleable Iron Co., Waukesha, Wis., automotive castings, has undertaken plant extension program which will call for an investment of $400,000.

Spring City Foundry Co., Waukesha, Wis., cylinder blocks and other automotive castings, plans improvements costing $150,000.

Wrought Washer Mfg. Co., Milwaukee, one of the world's largest producers of washers, is making a new investment of $500,000 in plant, the program calling for replacement of the present works on a new site. The concern has purchased the former plant of the Beaver Engine Co., with 16 acres and a building of 250 x 450 ft., and will soon add a modern rerolling mill.

Snap-On Wrench Co., Milwaukee, wrench and tool sets for motor cars and mechanics' tools), has awarded contracts for the construction of a new plant and office building costing about $250,000, on a new site at Kenosha, Wis.

Fremont Fabrics Purchased

LIMA, OHIO, Dec. 30—Fremont Auto Fabrics Co., manufacturers of automobile seat covers, slip covers and other auto accessories, has been purchased by the S. L. Jackson Co., of this city. This will increase the employment of the plant to 100 persons.

Swiss Invents Radio Garage Door Opener

WASHINGTON, Dec. 30—A system for opening and closing garage doors automatically through the medium of radio waves has been invented in Switzerland, according to an announcement of the chief engineer of the electrical plants of Neufchatel appearing in the Swiss press and transmitted to the Department of Commerce by its office at Berne. The manner of operation is explained by the inventor as follows: a few yards in front of the garage, the driver presses a button fixed near his seat in the car which causes waves to be sent out. These waves are picked up by an aerial fixed on top of the garage and serve to start a motor which automatically opens or closes the doors.

A.A.A. Issues Revised List of Driver Ratings

WASHINGTON, Dec. 30—A corrected list of the standing and accumulated points of championship drivers has just been issued by the Contest Board of the American Automobile Association. The correct point accumulation and rating of the leading 20 drivers for 1929 follows:

Place	Name	Points
1.	Louie Meyer	1330
2.	Ray Keech	1000
3.	Wilbur Shaw	260
4.	Fred Frame	231
5.	Cliff Woodbury	200
6.	Cliff Bergere	186
7.	James Gleason	171
8.	Fred Winnai	168
9.	Frank Brisko	110
10.	Myron Stevens	110
11.	Deacon Litz	90
12.	Lou Moore	70
13.	Billy Arnold	61
14.	Wm. Cantlon	60
15.	Ernest Triplett	50
16.	Chet Gardner	46
17.	"Speed" Gardner	39
18.	Russell Snowberger	35
19.	Zeke Meyer	35
20.	Bob Robinson	25

Austin to Exhibit

DETROIT, Dec. 31—The American Austin Car Co. will have a display of its forthcoming product, the Austin Bantam car, at the Hotel Shelton, New York City, during the National Automobile Show, Jan. 4-11. This display will be exclusively for dealers. A chassis, a coupe and a commercial delivery car will be shown.

French Ford Denies Rumor

PARIS, Dec. 27 (*by cable*)—A report that the French Ford Co. would produce a "baby" car in the factory at Cologne has been flatly denied by officials of the company. This report appeared originally in "La Journee Industrielle," a French commercial daily, and was cited in *Automotive Industries* for Dec. 14.

Steel Mills Look for Marked January Uplift

NEW YORK, Dec. 31—Decks have been cleared for broader activities in the steel market. Schedules of the Mahoning Valley rolling mills for the week show marked improvement, and a relatively brisk movement of sheets and strip steel is looked for in January. Emphasis is laid on heavy Ford buying of these descriptions of steel, but there has been more or less of an all around increase in business from the general run of automotive consumers. In fact, it is this distribution of the business over a relatively large number of consumers that is, at least so far, the most encouraging feature of the revival.

Tonnages involved in individual orders continue to be extremely conservative, but being in a decidedly cheerful mood, the steel market is more inclined to resort for a comparative yardstick to November's intensive dullness and steadily dwindling backlogs than to the high rate of operations that was possible in December, 1928, and that held up fairly well during January, 1929.

Releases against old orders for cold-finished steel bars have been numerous in the last few days, some of these for shipment following completion of inventories by buyers. Interest in automotive alloy steels is much better. So-called "stainless" steel, manufactured under foreign patents by American licensees, is attracting considerable attention for trim and other exposed parts. While occasional price-shading of blue annealed sheets in sizes that are competitive with strip is reported, the market for sheets in general is extremely steady. Strip-steel prices are also holding well. There has been no pressure on the market in what commitments have so far been placed.

Pig Iron—Automotive foundries are showing increasing interest in the pig iron market. Melters have been anxious to have just as little iron as possible on hand during their inventory periods, but with stock-taking out of the way, a fairly good number of inquiries for first quarter iron overhang the market, which continues unchanged in price.

Aluminum—A leading authority estimates United States production of aluminum in 1929 to have been 198,000,000 lb. and world production to have reached 585,000,000 lb., compared with 500,000,000 lb. in 1928. By 1938, this authority looks for a world output of 1,000,000,000 lb. The market is slightly more active. Remelted metal is in ample supply, so that specialists in that field expect a steady rather than a stronger market when demand becomes more active. Prices for virgin metal are unaltered.

Copper—The market is dull with producers' prices and levels in the "outside" market unchanged.

Tin—Singapore interests have been liquidating as much of their holdings as possible before the New Year, and this affected prices in favor of consumers. A little metal at below 40 cents was picked up by the latter.

Lead—Quiet. More buying for January and February needs of storage battery manufacturers is looked for to develop next week.

Zinc—Steady.

Herr Wilhelm Maybach is Dead

Automotive pioneer, last survivor of famous trio of German engineers, dies in Stuttgart, Germany, aged 84

WILHELM MAYBACH, the last of Germany's great trio of automobile pioneers (Daimler, Benz, Maybach), died at Stuttgart on December 30. He was nearly 84 years old. When Maybach began the development of light, liquid-fuel engines and motor vehicles, in the early eighties, he had a background of ripe engineering experience, for from 1872 to 1882 he had been chief engineer of the Deutz Gas Engine Works, manufacturers of the Otto engine and then the foremost firm in its branch.

At Deutz Maybach was associated with Gottlieb Daimler, who had proposed the development of motor road vehicles to the heads of the firm but had received no encouragement, and when Maybach resigned in 1882 he joined Daimler at Cannstatt in Wuertemberg to undertake such development.

In the popular mind Maybach did not figure as prominently in the early history of the automobile as did either Daimler or Benz, which is probably due to the fact that he did not work independently and organize his own company, but filled the position of technical director of the Daimler Motor Company. As an engineer, however, he undoubtedly ranked first among the trio. His crowning achievement in automobile development was the production of the Mercedes car in 1900, which was an instant success and which for many years ranked as the world's finest automobile.

Daimler was primarily a pioneer, an inventor, while Maybach was more of an engineer and a production man. The Daimler Motor Company during the early stages of its career seems to have been handicapped by the lack of a capable commercial executive. This appears to have been one of the chief reasons why some of the French licensees under the Daimler patents, notably Panhard & Levassor, greatly outstripped the German firm.

In 1899 Daimler and Maybach were joined by an Austrian business man, Herr Jellineck, one of the early automobile enthusiasts, whose attention had been drawn to them in the first place by learning, while in Paris, that Panhard then obtained his engines from Daimler. Jellineck secured an exclusive sales agency for Daimler cars for a period of five years, and at once became a dominant factor in the conduct of the business.

The Mercedes car, named after Mercedes Jellineck, oldest daughter of the sales agent, which appeared during 1900, embodied for the first time in automobile practice many features that later became quite common. It was the first car to have a pressed steel frame, drop-forged, I-section axles (chain drive), Mercedes or reversed-Elliott-type steering heads, mechanically-operated inlet valves (in previous engines these valves were suction-operated), a cellular radiator, an engine flywheel with fan-spokes, a selective sliding gear transmission, and internal enclosed brakes. Of these features some were invented by Maybach while others, which were known in other lines of engineering, were introduced by him in automobile practice. Maybach also claimed the invention of hot-tube ignition and of the constant level, spraying carburetor.

Wilhelm Maybach

Jellineck had an eye on the rich clientele that flocked to the season resorts, which at that time loomed large among automobile prospects, and the Mercedes made its debut at Nice, where motor sports customarily inaugurated the season at that time. It made a clean sweep of the meet, winning all three of the principal events, the touring contest, the La Turbie hill climb and the flying kilometer speed trial on the Boulevard des Anglais.

That it should beat the previously invincible Panhards was something entirely unexpected and created a sensation. Its reputation was made. French engineers who examined it were particularly struck by the narrow-faced transmission gears, which seemed to be entirely too small for the 40 hp. of the engine. These proved to be made of Krupp chrome-nickel steel, heat-treated, of more than twice the strength of the carbon steel previously used, and were found to be quite adequate.

Daimler died in 1900, and during a reorganization some years later Maybach resigned from the firm and organized the Maybach Motor Manufacturing Company of Friedrichshafen, which has become famous as builder of Zeppelin engines. At the present time the Maybach firm is a subsidiary of the Zeppelin Airship Construction Company. It also manufactures automobile and marine engines, complete automobiles and railcar engines of the Diesel type.

Maybach designs always have borne a touch of originality. In the automobile engine, for instance, the cylinder block is almost completely submerged in the aluminum crankcase, which gives a "clean" exterior and has mechanical advantages as well. The Diesel engine is probably the only successful multi-cylinder, high-speed, oil-burning engine employing air injection. The automobiles always have been of the *de luxe* type. For many years a six-cylinder car was turned out, with a two-speed planetary transmission, and quite recently a twelve-cylinder model on similar lines was announced.

Many honors were showered upon Maybach in recognition of his engineering accomplishments. The honorary degree of Doctor of Engineering was conferred upon him by a German university, and he was elected an honorary member of the German Automobile-Technical Society not long after its organization, some twenty-five years ago.
—P. M. HELDT.

Details of New Maybach Car

Following are some details of the new twelve-cylinder Maybach car taken from *Allgemeine Automobil Zeitung:* The car has an engine of 3.39 in. bore and 3.94 in. stroke, with a displacement of 420 cu. in., which develops 150 hp. at 2800 r.p.m. The cylinder arrangement is the usual one of two banks making an angle of 60 deg. with each other. Valves in the head are operated from a single camshaft through side rods and tappets. The clutch is a single-plate type and the transmission the conventional three-speed design, but an over-gear is incorporated in the propeller shaft. The rear axle has an aluminum alloy housing and gives a reduction ratio of 5.5 to 1. Brakes are of the mechanical type and are not equalized. As compared with the previous six-cylinder Maybach the low frame is particularly impressive. By placing the floor of the body between frame side rails adequate head room is maintained. The chassis price is 23,000 marks and the price of the complete car 29,700 marks (approximately $5,500 and $7,000 respectively).

Motor Equipment Sales Declined in November

NEW YORK, Dec. 30—Parts and equipment showed a marked decrease in business activity during November, according to monthly index figures compiled by the Motor and Equipment Association. The original equipment index for November was 81 as compared with 160 for October, and 163 for November of last year.

The service parts index was 135 for November, as compared with 166 for October and 149 for November of last year. The accessories index stood at 75 for November, 91 for October, and 78 for November of last year. Service equipment index was 113 for November, 147 in October, and 122 for November of last year.

The general index for all classifications was 90 for November this year, 156 in October, and 153 for November of last year. Wholesalers' sales index was 147 for November, based on figures placing the January, 1928, sales at 100. On the same basis the index was 156 for October. Accounts receivable by wholesalers were indexed at 123, as compared with 134 in October, showing an improved situation in collections.

Italy Has 300,000 Vehicles

WASHINGTON, Jan. 1—There are today 300,000 auto-vehicles in Italy, according to a report received by the Department of Commerce from Trade Commissioner D. F. Spencer, Milan. They include passenger cars, motorcycles, buses, trucks, trailers and farm tractors. There are 100,000 persons who receive their livelihood in Italy from the manufacture and sale of autovehicles. The total value of cars made in 1928 exceeded $80,000,000. The Italian automobile industry ranks fourth in Europe in point of production. Fifty per cent of the production is exported, ranking fourth in importance among Italy's exports and accountable for more than $25,000,000 of Italy's foreign trade.

Iowa Receipts Rise

DES MOINES, IOWA, Dec. 30—Automobile registration receipts this year reached $11,919,006.13, an increase of nearly $1,000,000 over 1928, according to E. M. Smith, secretary of state, increased registration accounting for nearly three-quarters of the increase. Change in the state law requiring licensing of trucks on basis of actual load carried accounted for gain of only $235,000 in the total income, he said. Latest totals on registration indicate that the current year will record 799,862 vehicles, as compared with 741,673 in 1928.

Cooper-Hewitt Changes Name

NEW YORK, Dec. 30—The Cooper-Hewitt Electric Co. will be known as the General Electric Vapor Lamp Co. on and after Jan. 1., it is announced by William A. D. Evans, president. The trade mark Cooper-Hewitt heretofore used will be retained as the trade designation of the products manufactured by the General Electric Vapor Lamp Co., he stated.

Pawn Shop for Used Cars Opened in Prague

WASHINGTON, Dec. 30—A pawn shop which lends money on automobiles, trucks and tractors has been established in Prague, Czecho Slovakia, according to a report received in the automotive division, Department of Commerce, from its Prague office. After the value of the car has been determined by an official appraiser a loan of 50 per cent of this amount is made, the loan being usually issued for a period of three months. While the loan is outstanding, the car must be kept in a special garage, which charges from 200-300 crowns (approximately $6-$9) per month for storage.

Outboard Adopts Starters

MILWAUKEE, Dec. 30—The 1930 line of outboard engines being announced by the Outboard Motors Corp., Milwaukee, embraces a number of models equipped with electric starting devices. The starter is a built-in part of the engine, replacing the usual flywheel but is so designed that no moving parts are exposed. This is the first time the electric starter has been applied to outboard engines. The Milwaukee concern is a recent consolidation of the Evinrude Motor Co. and the Elto Outboard Motor Co., Milwaukee, and the Lockwood Motor Co., Jackson, Mich. The three plants have been combined in the Evinrude works at Milwaukee. Stephen F. Briggs, head of the Briggs & Stratton Corp., Milwaukee, is chairman of the board, and Ole Evinrude is president.

Body Plant Reopens

EVANSVILLE, IND., Dec. 30—Woodworking departments of the Graham-Paige Body Corp. have resumed operations with a force of 150 men. The plant will formally open Jan. 6 and will have reached normal production schedule with 1000 men on the payroll about Jan. 15, according to R. E. Stone, secretary.

Purchase Snow Equipment

MILWAUKEE, Dec. 30—Appropriations aggregating approximately $1,000,000 are being expended for trucks, tractors, snow plows and other highway clearing operations by county highway commissions in Wisconsin, a survey reveals. Most of the equipment used in Wisconsin for snow removal is of the heavy-duty type and consists largely of Caterpillar and Monarch tractors, Clintonville and Oshkosh four-wheel drive trucks, equipped for the most part with Wausau snow plows.

Car Loadings Estimated to Drop 13.5 Per Cent

WASHINGTON, Jan. 1—Car loadings of automobiles, trucks and parts in the first quarter of 1930 are estimated at 246,746 by the 13 Shippers' Regional Advisory Boards reporting to the Car Service Division of the American Railway Association. This represents a decline of 13.5 per cent under the 285,313 cars actually loaded in the first quarter of 1929 and is the heaviest drop of any of the estimates made for the 29 commodities covered in the reports.

The total for the 29 commodities is estimated at about 7,664,499 cars in the first quarter of 1930, a reduction of 43,905 cars or 0.6 per cent under the actual loadings of 7,708,404 cars in the first quarter of 1929. The Car Service Division said that in connection with the anticipated reduction in shipments of automobiles, consideration must be given to the fact that the automobile industry in the first quarter of 1929 was unusually active, with the result that demand for freight cars for the first quarter of the year just ended was above the average.

Crude Rubber Inactive

NEW YORK, Dec. 30—The intervention of a holiday served further to retard an inactive market in crude rubber last week, according to the F. R. Henderson Corp. There was a slight gain in prices toward the close of the week, with December positions selling slightly higher than earlier in the week when a new low was established at 15.10. There seems to be a little better feeling with the renewed buying interest but it is doubtful, in the opinion of the Henderson company, whether the higher prices will be sustained. Stocks of rubber in London were increased to 53,894 tons, with Liverpool stocks up to 18,696 tons. The latest estimate for world shipments during 1929, according to a special statement by Mr. Henderson as president of the Rubber Exchange, is 860,000 tons as compared with 660,000 tons in 1928. World consumption will probably exceed 800,000 tons as compared with 670,000 tons the previous year, according to Mr. Henderson's estimate. No estimates have yet been made as to 1930 consumption or production.

Form New Company

BUFFALO, Dec. 30—A. B. Schultz and William Clare, formerly president and sales manager respectively of the Houde Engineering Corp., have organized the Visco-Meter Corp., to manufacture a dash type viscosimeter which will tell at all times the viscosity of the oil in the crankcase.

To Open Canadian Plant

REGINA, SASK., Dec. 30—Announcement has been made that the Stoughton Co., of Stoughton, Wis., manufacturers of commercial car bodies and cabs, will start a sub-assembly plant here for their products early in the spring of 1930.

Automobile Exports Gain; Leading All Commodities

WASHINGTON, Jan. 2—Exports of automobiles reached the record total of more than $550,000,000 with an increase of 10 per cent in 1929 when compared with 1928, leading all other commodities, according to a statement by Director William L. Cooper of the Bureau of Foreign and Domestic Commerce. The gain in exports of automobiles was made despite the fact that toward the close of the year the foreign sales were somewhat less than in the corresponding months of 1928.

The year 1929 was a record breaker in American foreign trade, both exports and imports showing an increase over the preceding year, and reaching totals which, when adjustment is made for the changes in the buying power of money, decidedly surpass any attained even during the war and the immediate post-war boom, Mr. Cooper stated. He said that if December shows the same figures as that month did in 1928, total exports of all commodities will amount to about $5,300,000,000, or between 3 and 4 per cent more than during the preceding year, and imports to about $4,450,000,000, an increase of 8 per cent.

"The statistics of import trade in the last three or four years have been much affected by price variations," said Mr. Cooper. "Thus, in 1925 and 1926, rubber prices soared, bringing up decidedly the total value of all imports. Since that time rubber has dropped greatly in price, and notwithstanding steadily increasing quantities, the value of rubber imports has fallen off."

Rubber was among the list of items showing a record in the import movement, purchases of that product reaching the huge total of more than 1,250,000,000 lb., with a gain of 25 or 30 per cent, as compared with 1928.

Building Special Machine

MILWAUKEE, Dec. 30—The Davis & Thompson Co., builder of special machine tools used largely in the automotive industries, is completing a vertical drilling machine for the Ford Motor Co., Detroit, which is notable in that it is of the 12-spindle continuous drilling type and is designed to supplant 20 of the Ford company's present high speed drills. Davis & Thompson have continued 24-hour a day production since the recent letdown, and has orders which will require capacity operations until the middle of next May, it is stated. All of its products are special machines for special purposes and there has been no cancellation of orders or requests to defer delivery.

Purchases Curtiss Planes

NEW YORK, Dec. 30—The Netherlands Indian Government has just placed an order in the neighborhood of $250,000 with the Curtiss Aeroplane Export Corp. for eight Curtiss Conqueror Hawk pursuit single-seater airplanes, spare airplane and engine parts and spare Conqueror engines, according to an announcement authorized today by K. E. Van Dyk, the resident manager of Lindeteves-Stokvis, who are the representatives of Curtiss in the Dutch East Indies.

Prague May Debar Gas Pump Additions

WASHINGTON, Jan. 2—A protest against the erection of new filling stations in greater Prague on the ground that they tend to congest traffic has been filed and a decision will be rendered within a short time, according to Assistant Trade Commissioner Sam E. Woods in a report to the Department of Commerce. In Prague there are 170 filling stations which are on public property. In addition to these there are about 50 stations on private property, usually in garage yards or courts.

Change Chinese Valuation

WASHINGTON, Jan. 2—For customs valuation purposes, the wholesale market value of motor vehicles imported into China is now determined by the addition of 10 per cent to the c. i. f. invoice value, instead of 5 per cent as formerly, according to a radiogram received by the Department of Commerce from Trade Commissioner Frank S. Williams, Shanghai. On parts and accessories the basis for determining the wholesale market value has been reduced to 10 per cent above the c. i. f. invoice value, instead of 20 per cent as formerly.

Goodyear Plant Stepped-Up

BIRMINGHAM, Jan. 3—The Gadsden plant of the Goodyear Tire & Rubber Co. was put on a six-day basis on Jan. 2, according to announcement by C. Slusser, vice-president. Production will also be steadily increased, he said, until the turnout will be increased from 4000 tires to 7500 per day. Extra men will be added to the payroll. The plant has been on a five-day basis. Work of the reclaiming plant was increased from 15 tons per day to 25 tons.

While in Birmingham the party was the guests of R. T. Lauderback, manager of the Bill Pape Tire Co., Fisk distributors in Birmingham.

Motor Wheel Distributes Bonuses

DETROIT, Dec. 30—The Motor Wheel Corp., of Lansing, Mich., distributed $125,000 in Christmas bonus checks to 400 employees. Stockholders also shared in the success of the company for the year just closing, a cash dividend of 75 cents per share having been paid Dec. 10, totaling $618,750. The company's dividend record for the past three years follows: 1927, cash $1,100,000; 1928, cash $1,306,250 and 137,500 shares in stock, and 1929, cash $1,993,750 and 137,500 shares in stock.

The corporation will have several representatives at the national automobile shows, it was announced.

General Motors Sales Continue 1928 Record

NEW YORK, Jan. 3—General Motors retail sales during 1929 were practically the same as the record performance of 1928, according to Alfred P. Sloan, Jr., president, in a letter to stockholders mailed today accompanying the extra dividend declared Nov. 14. According to estimate at this time, retail sales during the last quarter of 1929 somewhat exceeded the corresponding quarter of 1928, despite the moderately lower production for that period.

Mr. Sloan commented on the widening of scope of the corporation's activities during the past year with the acquisition of interests in Bendix Aviation Corp., Fokker Aircraft Corp., and General Motors Radio Corp. "These acquisitions," says Mr. Sloan, "together with the important developments that have taken place through the Frigidaire Corp., have resulted and will still further result, through natural evolution, in an increasing diversity of General Motors activities and should accomplish a more effective capitalization of our manufacturing plants and equipment, our organization and our extensive distributing system throughout the world."

White Adds Bus Model

CLEVELAND, Dec. 30—A newly developed bus chassis, embodying several mechanical refinements, has been added to the six-cylinder line of the White Co., according to an announcement made by officials of the company. Introduction of this new model gives the White Co. five six-cylinder bus chassis, ranging in seating capacity from 18 to 41 passengers on wheelbases of 170 to 250 in. Designated as Model 65-A, this new chassis will combine all the features of the Model 65 and will in addition be of longer wheelbase, afford greater seating capacity, have a heavier frame, spring and axles, larger tires, and have a gross weight of 18,000 lb. The engine is of 396 cu. in. displacement with a bore of 4 in., stroke of 5¼ in.

Former Tube Plant Sold

TRENTON, N. J., Dec. 30—The plant of the former Fisk Flap Tube Rubber Co., Yardville, N. J., was sold recently at Sheriff's sale to satisfy a claim of $39,000 held by Hyman A. Rosenthal, president of the Near Para Rubber Co., and Michael Gilinsky, former owners. There is a second mortgage of $250,000 on the property. The concern was at one time owned by the late Charles F. Fisk, who manufactured a patented tube there.

German Tariff Continued

WASHINGTON, Jan. 2—The present German tariff schedule, which was to have expired on Dec. 31, 1929, has been extended indefinitely, according to a cablegram received by the Department of Commerce from Commercial Attache H. Lawrence Groves, Berlin.

Sterling Adds 2 Models, Rounding Out Truck Line

MILWAUKEE, Dec. 30—By adding a 3½ to 4½-ton bevel drive model and a 5½ to 6½-ton worm-drive chassis, the Sterling Motor Truck Co., Milwaukee, has rounded out its line to include worm, bevel and chain drive chassis ranging from 1 to 12 tons, except for the rear. Both models embody similar units of different capacity including six-cylinder engines, multiple disk clutches, four-speed transmissions, four-wheel hydraulic brakes equipped with boosters and pressed steel wood-lined frames. They differ decidedly in the rear axle construction, a bevel type rear being used in Model DB15 and worm in Model DW20, the heavier of the two.

Model DW20, which is furnished in three wheelbases, 166, 180 and 154 in., is available with either a 4⅜ x 5⅛-in. engine developing 88 hp. at 2000 r.p.m., or a 4 x 4¾-in. engine developing 71 hp. at 2000.

Model DB15 is a lighter edition of the heavier model and is designed for speedy delivery. It is supplied in several wheelbases: 163, 151, 177 and 133 in. and powered by a 3¾ x 4½-in. engine developing 64 hp. at 2200 r.p.m. Service brakes are four-wheel Lockheed hydraulic, amplified with vacuum boosters with 16 x 2½-in. drums in front and 17¼ x 5-in. drums at rear. The parking brake is mounted on the propeller shaft and acts on a 11 x 4-in. drum.

Milwaukee Section Grows

MILWAUKEE, Dec. 30—Growth of the automotive industries in the Milwaukee district in the past five years is indicated by the fact that the membership of the Milwaukee Section, S.A.E., has increased within that period from 50 members to 175. At no time was there a membership "drive," the increase being a natural one created by the increased automotive engineering activities.

In recognition of the importance of Milwaukee and nearby cities in the tractor manufacturing industry, the Chapter will devote its regular meeting in February to an all-day conference upon tractor problems. The session probably will be held at Racine. Leading engineers from other parts of the country are expected to participate, according to Arthur C. Wollensak, chief engineer, Sterling Motor Truck Co., Milwaukee, chairman of the local section.

Norwalk Declares Dividend

NORWALK, OHIO, Dec. 31—The directors of the Norwalk Auto Parts Co., at a recent meeting, declared its semi-annual preferred stock dividend, payable Dec. 31, on stock of record Dec. 20. President Linendoll's report showed the company had for several months past undergone very heavy experimental and laboratory expense in the development of the Linendoll headlight tester and other new equipment; however, in view of the company's excellent financial condition, the directors voted a quarterly common stock dividend payable Dec. 31 on stock of record Dec. 20, 1929.

Austria May Abandon Car Import Quota

VIENNA, Dec. 23—Imports of foreign automobiles into Austria, which have hitherto been on a strictly limited contingent or quota basis, will be freed from restriction, according to reports in commercial circles today, on July 1. It is thought, however, that the duty on automobiles will almost certainly be raised to protect local makers. The abolition of the contingent would be very important to American manufacturers, whose products are in great demand here as being eminently suited to Austria's rough and hilly roads.

G.M. Holders Increase

NEW YORK, Dec. 31—The total number of General Motors common and preferred stockholders for the fourth quarter of 1929 was 198,600, compared with 140,113 for the third quarter, 125,165 for the second quarter, and 105,363 for the first quarter. There were 176,693 holders of common stock and the balance of 21,907 represents holders of preferred and debenture stocks. These figures compare with 117,767 common stockholders and 22,346 preferred for the third quarter, with 102,306 common and 22,859 preferred for the second quarter, and with 82,415 common and 22,948 preferred for the first quarter.

Asks Vehicle Inspection

TRENTON, N. J., Dec. 30 — State Motor Vehicle Commissioner William L. Dill will ask the Legislature at the 1930 session to enact a law compelling frequent inspection of automobiles for mechanical defects. Conviction of Mr. Dill is based on the results of the inspection campaign conducted by the state in cooperation with Pennsylvania. About 615,000 automobiles were inspected in New Jersey. There were 16,949 instances in which brakes were found in need of relining, and the steering mechanisms of 3,214 machines were faulty.

Gas Tax Figures Reported

NEW YORK, Dec. 30—During the first six months in which the New York State gasoline tax has been effective the state has collected $15,494,034 from the two-cent levy, according to announcement by Tax Commissioner Thomas M. Lynch, of Albany.

McDaniel Plant to Move

WOOSTER, OHIO, Dec. 30—The McDaniel Battery Separator Co., of this city, is planning to move its plant to Akron, it has been announced. J. H. McDaniel will continue as vice-president.

Massillon Plants Begin Output on New Schedule

MASSILLON, OHIO, Dec. 30—Prospects of greatly improved business conditions in 1930 had an optimistic outlook this week when three of the city's leading industrial plants having to do with the automotive industry announced increased operation schedules.

The Central Alloy Steel Corp. began operations on a 50 per cent basis in its open-hearth departments. The 24-in. mill and the bloomng mill also began operations on a similar scale.

The local plant of the Eaton Spring Co., which has been operating on a greatly reduced basis, is taking on more than 200 additional men. This will place the plant on a 60 per cent operating basis.

New orders which have been received by the local plants of the Reliance Manufacturing Co. have necessitated the hiring of more men, and officials of the plants feel that increased orders forecast a general upward movement for the company's business.

Larrabee-Deyo Adds Models

BINGHAMTON, N. Y., Dec. 30—A three-ton, Model 51, and a five-ton chassis, Model 80, have been added to the 1930 line of Larrabee-Deyo trucks. Model 51 has a 171 in. wheelbase and is powered with a Continental 18R engine. Pneumatic tires, 34 by 7, are standard equipment on all wheels. The heavier model has a Continental 21R engine, and is equipped with 36 by 8 pneumatic tires. Major units on both models include Perfex radiator, Zenith carburetor, Auto-Lite ignition, generator and starter, Brown-Lipe multiple disk clutch, four-speed Brown-Lipe transmission, full-floating worm-gear Timken axle, and Ross steering gear.

Ohio Registrations Rise

COLUMBUS, OHIO, Dec. 30—Estimated registration of passenger cars for 1929 as given out by the Department of Motor Vehicle Registration for Ohio is 1,538,000, which will be approximately 110,000 over the total registration of passenger cars in 1928, which amounted to 1,450,994. Estimates on truck registration for 1929 are 200,000, which is slightly in excess of the 198,705 registered in 1928. There were 200,000 transfers of license plates issued during 1928 and this number is expected to be equaled in the present year.

Canadian Tire Prices Increased

TORONTO, Dec. 31—The automobile tire manufacturers have issued their new booking prices, which are approximately 10 per cent higher than former prices, though the dealer is to be allowed a discount from this list which will make practically no change in the actual cost of tires to the trade. It is stated that the new list will enable dealers to make a better margin of profit on sales than they have done heretofore.

Great Lakes New Plant Will Produce in April

DETROIT, Dec. 30—The Great Lakes Steel Corp., a unit of the National Steel Corp., will complete its new plant next April. The open-hearth department will have six 150-ton furnaces. The mill equipment will include a 40-in. reversing blooming mill, a 21-in., 10-stand, continuous sheet bar and billet mill and a four-high 11-stand continuous hot strip mill with a capacity for rolling material up to 30-in. wide.

There will be two reheating furnaces. The open-hearth furnaces and the reheating furnaces will be built for the use of any fuel and will be operated at the start on fuel oil. The open-hearth furnaces will be equipped with waste heat boilers. The soaking pits will be producer gas-fired. The plant will have a capacity of 35,000 to 40,000 tons of finished steel per month.

To Broadcast N. Y. Show

NEW YORK, Dec. 30—Descriptions of the New York automobile show will be broadcast over the National Broadcasting Co.'s chain between 5 and 6 p.m., on the opening day of the show, Jan. 4. Phillips Carlin and Miss Marcella Shields will visit the exhibits and describe in detail the colorful pageant of 1930 models. Supplementing this there will be an orchestra. Special microphone facilities are being installed which will pick up the sounds of the crowds.

LaFrance to Display Trucks

NEW YORK, Dec. 30—The LaFrance-Republic Corp. will have a special display of the complete new line of LaFrance-Republic and American-LaFrance motor trucks at its Long Island City branch, Queens Blvd. and Rawson St., Long Island City, during the New York Automobile Show, according to an announcecment by F. L. Pierce, vice-president.

"Automotive Industries" Show Week Calendar

NEW YORK SHOW WEEK EVENTS

Jan. 6—Oakland Motor Car Co. Banquet. 6:30. Pennsylvania Hotel
Jan. 6—Willys-Overland. Luncheon. Biltmore Hotel
Jan. 7—Graham-Paige. Luncheon. 1:00 Biltmore Hotel
Jan. 7—N.A.C.C. Banquet. Commodore Hotel
Jan. 7—Natl. Assn. of Automobile Show & Assn. Managers Luncheon. 12:30. Roosevelt Hotel
Jan. 8—Motor & Equipment Assn. Banquet. Astor Hotel
Jan. 8—Automotive Electric Assn. (Sales & Service Convention) Astor Hotel
Jan. 8—Chrysler Sales Corp. Luncheon. 12:30. Commodore Hotel
Jan. 9—Willys-Overland. Banquet. 6:30. Commodore Hotel
Jan. 9—Overseas Auto. Club. Dinner. 6:30. Astor Hotel
Jan. 9—S.A.E. Annual Dinner, Penna. Hotel

CHICAGO SHOW WEEK EVENTS

Jan. 25—Studebaker Corp. Banquet. Palmer House
Jan. 28-29—Automotive Electric Assn. Convention. Stevens Hotel
Jan. 28—Graham-Paige Luncheon. 1:00. Palmer House
Jan. 28—Oakland Motor Co. Banquet. 6:30. Palmer House
Jan. 29—Willys-Overland. Banquet. 6:30. Palmer House
Jan. 29—Chrysler Sales Corp. Luncheon. 12:30. Congress Hotel
Jan. 29—Natl. Assn. of Automobile Show & Assn. Managers Luncheon. 12:30. Stevens Hotel

Tire Company Reorganizing

MONTREAL, Dec. 30—The Howard Greenberg Tremble Co., Ltd., Verdun, Que., who are putting on the market the Howard puncture-proof tire, announce that they are going through a reorganization. Blanchet & Co., New York brokers, are incorporating a United States company, while Hardy Brothers, of Antwerp, are forming a European company which will include England, France, Belgium, Germany, Switzerland, Italy and Roumania. Mr. John Howard, the president, states that they will shortly publicly issue 50,000 shares at $10 each and he hopes to start production of the tire by spring.

Carrier Corp. Develops New Degreaser for Metals

NEW YORK, Dec. 30—A new vapor bath process for degreasing metals and other impervious materials has been developed by the Carrier Engineering Corp., Newark, N. J., and is expected to be made available commercially in a short time. In this process a solvent called "cecolene" is boiled and vaporized. The objects to be degreased are suspended in the vapor, which condenses on their cool surfaces, carrying off grease. The objects are kept suspended in the vapor until they near the temperature of the medium, which takes about 1½ to 3 minutes.

The vapor degreaser was developed in the Carrier experimental laboratories at the Newark plant. It is expected that a separate company will be formed to manufacture and market it.

Standard Adds Model

DETROIT, Dec. 30—A new 3½ ton, 156½-in. Fisher super-six with the option of an 18R Continental engine, bevel drive, or a 20R Continental, worm drive, has been added to the line of the Standard Motor Truck Co. Major integral units include a Zenith carburetor, Auto-Lite ignition, generator and starter, Brown-Lipe multiple disk clutch, 7-speed Brown-Lipe transmission mounted amidships, Blood Bros. universal joints, Ross steering gear, and mechanical four-wheel brakes.

Opens N. Y. Warehouse

NEW YORK, Dec. 30—Warehousing service for manufacturers of automobile parts and accessories has just been made available in the New York territory by the Automotive Warehouse Service Co., 17 W. Sixtieth St., New York City. The company will devote its entire attention to warehousing service and will not sell any lines, its announcement says.

Calendar of Coming Events

SHOWS

New York National.....Jan. 4-11
East Orange, N. J., Automobile ...Jan. 8-11
Newark (N. J.) Automobile Show..Jan. 11-18
Philadelphia, Automobile .....Jan. 11-18
Buffalo, Automobile .....Jan. 11-18
Milwaukee Automobile Show ....Jan. 11-18
Toronto, Automobile .....Jan. 11-18
Cincinnati, Automobile .....Jan. 12-18
Boston, Automobile .....Jan. 18-25
Detroit, Automobile .....Jan. 18-25
Baltimore, Automobile .....Jan. 18-25
Harrisburg, Automobile .....Jan. 18-25
Louisville, Automobile .....Jan. 18-25
Hartford, Automobile .....Jan. 18-25
Pittsburgh, Pa., Automobile .....Jan. 18-25
Brooklyn, Automobile .....Jan. 18-25
Montreal, Automobile .....Jan. 18-25
Louisville, Automobile .....Jan. 18-25
Los Angeles, Automobile .....Jan. 18-26
Rochester, Automobile .....Jan. 20-25
Nashville, Automobile .....Jan. 20-25
Wilmington, Del., Automobile ...Jan. 20-25
Chicago National Coliseum..Jan. 25-Feb. 1
Washington, D. C., Automobile Jan. 25-Feb. 1
Cleveland Automobile Show..Jan. 25-Feb. 1
Copenhagen Trucks, etc. ....Jan. 25-Feb. 2
Columbus, Automobile .....Jan. 26-Feb. 1
Portland, Me., Automobile...Jan. 27-Feb. 1
Wilkes-Barre, Automobile ...Jan. 27-Feb. 1
San Francisco, Cal., Automobile..Feb. 1-8
Minneapolis-St. Paul, Automobile..Feb. 1-8
Toledo, Ohio, Automobile .....Feb. 3-8
Wichita, Automobile .....Feb. 3-8
Cumberland, Automobile .....Feb. 3-8
Syracuse, Automobile .....Feb. 3-8
Ottawa, Automobile .....Feb. 3-8
St. Louis, Automobile .....Feb. 3-8
Cincinnati, Aircraft .....Feb. 8-14
Albany, Automobile .....Feb. 8-15
Akron, Automobile .....Feb. 8-15
Kansas City, Automobile .....Feb. 8-15
New York, American Legion, Aviation .....Feb. 9-15
Denver, Automobile .....Feb. 10-15
Indianapolis, Automobile .....Feb. 10-15
Sheboygan, Automobile .....Feb. 10-16
Mankato, Automobile .....Feb. 12-15
Peoria, Automobile .....Feb. 12-16
Providence, Automobile .....Feb. 14-22
Canton, Automobile .....Feb. 15-22
Omaha, Automobile .....Feb. 17-22
Copenhagen, Automobile .....Feb. 21
Camden, N. J., Automobile..Feb. 24-Mar. 1
Des Moines, Automobile ....Feb. 24-Mar. 1
Seattle, Wash., Automobile..Feb. 25-Mar. 2
Detroit (All-American Aircraft)..April 5-13
Asbury Park, N. J., Automobile..April 7-12

CONVENTIONS

National Automobile Dealers Association, New York City .....Jan. 6
American Road Bldrs. Assn., Atlantic City .....Jan. 11-18
Equipment for Motor Trucks, Inc., Atlantic City (during road show) Jan. 15
American Institute Electrical Engineers, New York .....Jan. 27-31
National Automotive Dealers Association, Chicago .....Jan. 27-28
Ohio Assn. of Commercial Haulers, Cleveland .....Jan. 30-31
Southwest Road Show and School, Wichita .....Feb. 25-28
American Society Mechanical Engineers, Fiftieth Anniversary Celebration: New York .....April 5
Hoboken, N. J. .....April 7
Washington, D. C. .....April 8-9

S. A. E.

Annual Meeting, Detroit.....Jan. 21-24

SALONS

Hotel Biltmore, Los Angeles.....Feb. 8-15
Palace Hotel, San Francisco, Feb. 22-Mar. 1